

DTIC FILE COPY

(2)



# AIR WAR COLLEGE

## RESEARCH REPORT

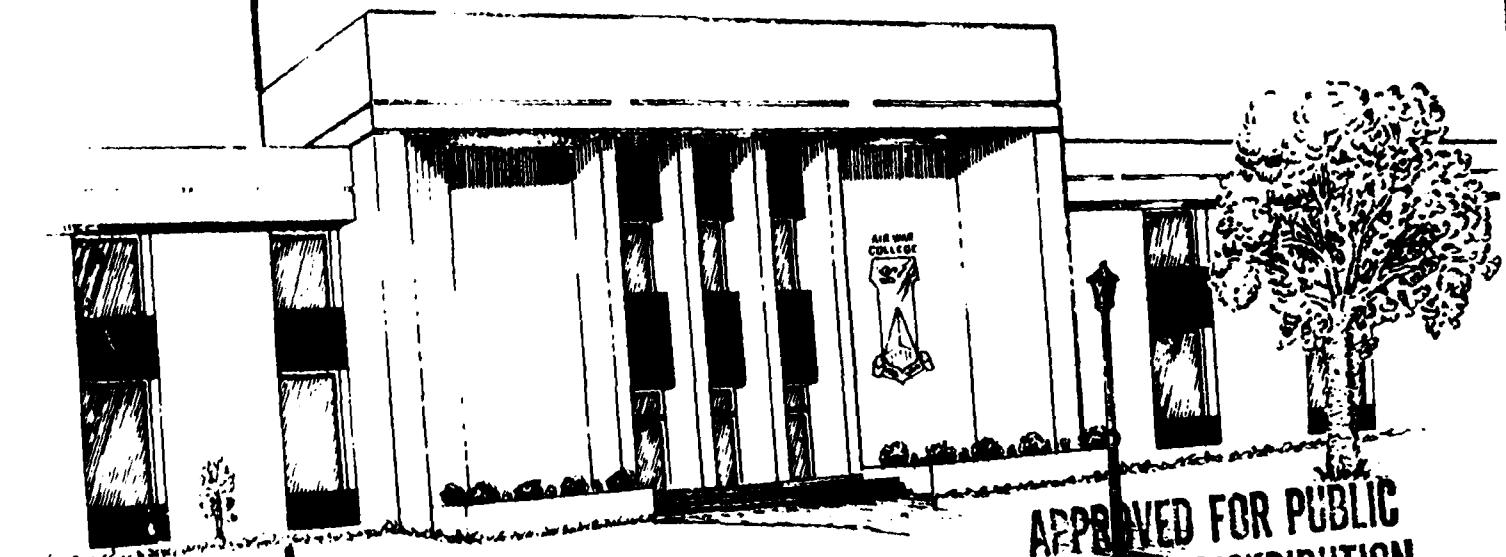
NATO 2000: THE ROLE OF THE SPANISH AIR FORCE

AD-A217 254

LT COL GONZALO DE CEA-NAHARRO CUENCA  
SPANISH AIR FORCE

1989

S DTIC  
ELECTED  
FEB 01 1990  
B D



AIR UNIVERSITY  
UNITED STATES AIR FORCE  
MAXWELL AIR FORCE BASE, ALABAMA

APPROVED FOR PUBLIC  
RELEASE; DISTRIBUTION  
UNLIMITED

50 01 31 152

AIR WAR COLLEGE  
AIR UNIVERSITY

NATO 2000: THE ROLE OF THE SPANISH AIR FORCE

by

Gonzalo de Cea-Naharro Cuenca  
Lt. Colonel, SAF

A DEFENSE ANALYTICAL STUDY SUBMITTED TO THE FACULTY  
IN  
FULFILLMENT OF THE CURRICULUM REQUIREMENT

Advisor: Colonel Melvin L. Greene

MAXWELL AIR FORCE BASE, ALABAMA

MAY 1989

#### DISCLAIMER

This study represents the views of the author and does not necessarily reflect the official opinion of the Air War College or the Department of the Air Force. In accordance with Air Force Regulation 110-8, it is not copyrighted but is the property of the United States government.

Loan copies of this document may be obtained through the interlibrary loan desk of Air University Library, Maxwell Air Force Base, Alabama 36112-5564 (Telephone: [205] 293-7223 or AUTOVON 875-7223).

## EXECUTIVE SUMMARY

TITLE: NATO 2000: THE ROLE OF THE SPANISH AIR FORCE

AUTHOR: Gonzalo de Cea-Naharro Cuenca, Lieutenant Colonel,  
Spanish Air Force

Since Spain joined NATO in 1982, many things have happened. The Socialist government held a referendum on March, 1986 to determine if Spaniards would like to continue in the Alliance. In spite of being a NATO member, Spain is not integrated in the military structure, in accordance with the government's view of "cooperation without integration". Spain, also, entered in the Western European Union (WEU) on December, 1988.

The paper covers some facts on the Spanish Air Force, analyzes the threat, NATO's air defense in Europe and the Spanish Strategic Concept. The author deals with some possible actions of control in the air space and how this control will be in Spanish strategic areas in the year 2000. The final conclusions are the significant role of the Spanish Air Force in NATO 2000s.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



## BIOGRAPHICAL SKETCH

Lieutenant Colonel Gonzalo de Cea-Naharro graduated from the Spanish Air Force Academy in 1966. He is a fighter pilot with more than 4500 flying hours and has the specialization in Communications and Electronics. He has a Master's Degree in Journalism and Public Relations, publishing frequently in newspapers and magazines in Spain.

When Spain joined NATO, he was assigned as representative of the Spanish Air Force to the Communications Air Working Group, meeting in Brussels for three years. He has attended different NATO courses in Germany, Portugal and Spain. He is a graduate of the Spanish Air Staff College and Air-Army Cooperation College. Lieutenant Colonel Cea is also a graduate of the Air War College, class of 1989.

## TABLE OF CONTENTS

CHAPTER	PAGE
DISCLAIMER.....	ii
EXECUTIVE SUMMARY.....	iii
BIOGRAPHICAL SKETCH.....	iv
1.- INTRODUCTION.....	1
2.- THE SPANISH AIR FORCE AT THIS MOMENT.....	3
2.1. The Air Force.....	4
2.1.1. The Air Combat Command.....	5
2.1.2. The Tactical Air Command.....	5
2.1.3. The Air Transport Command.....	6
2.1.4. The Canary Islands Command.....	7
3.- SPAIN'S GEOSTRATEGIC VALUE.....	7
4.- THE THREAT.....	9
5.- SDI INFLUENCE IN EUROPEAN STRATEGIC CONCEPT.....	14
6.- SPAIN AND ARMS REDUCTION.....	16
7.- NATO'S AIR DEFENSE IN EUROPE.....	18
8.- STRATEGIC SPACE OF NATIONAL INTEREST.....	18
8.1 Analysis of the different zones.....	20
9.- SPANISH STRATEGIC CONCEPT.....	22
9.1. Difficulties for Spain's Air Defense.....	23
9.2. Elements necessary for exercising control.....	24

10.-	THE SPANISH MILITARY CONTRIBUTION TO NATO.....	25
11.-	ACTIONS OF CONTROL IN THE AIR SPACE.....	28
12.-	DEVELOPMENT OF CONTROL IN SPANISH AIR SPACE.....	29
13.-	AIR CONTROL IN THE YEAR 2000.....	30
14.-	BUT, AT THE END, ALWAYS THE MAN.....	32
15.-	CONCLUSIONS.....	33
16.-	APPENDIXES.....	37
	(A) THE SPANISH AIR FORCE AT THIS MOMENT.....	38
	(B) THE AIR FORCE.....	39
	(C) THE AIR COMBAT COMMAND.....	40
	(D) THE TACTICAL AIR COMMAND.....	41
	(E) THE AIR TRANSPORT COMMAND.....	42
	(F) THE CANARY ISLANDS COMMAND.....	43
	(G) SPAIN'S GEOSTRATEGIC VALUE.....	44
	(H) THE THREAT.....	45
	(I) STRATEGIC SPACE OF NATIONAL INTEREST.....	46
	(J) THE SPANISH MILITARY CONTRIBUTION TO NATO.....	47
	(K) THE EUROPEAN FIGHTER AIRCRAFT (EFA/ACE).....	50
15.-	LIST OF REFERENCES.....	53
16.-	BIBLIOGRAPHY.....	54

## NATO 2000: THE ROLE OF THE SPANISH AIR FORCE

"Spain, be yourself, discover your origins, enliven your roots, revive those authentic values which made your History glorious and your presence on other Continents beneficial. Thus you will find your History to be vertebrate and become capable of the breadth of vision to go beyond it towards higher goals, to face the challenges of the future with a vigorous vitality and renewed creativity..."

-Pope John Paul II- (Spain 1982)

### 1.- INTRODUCTION

Spain has a history of not being involved in European conflicts. Ever since Spain defeated Napoleon's armies at the beginning of the nineteenth century, Spain stopped taking part in European conflicts. Spain was neutral in both world wars and probably for this reason, Spaniards do not share the central European perception of a foreign threat. The Spanish War of Independence was against a special member of NATO: France. At the end of the last century, Spain fought for Cuba and the Philippines, but the enemy was NATO's chief member, the United States. The other foreign war was fought, against Morocco, in North Africa, near Ceuta and Melilla Spain also has an open wound to the

South: Gibraltar. If it does not revert to Spanish sovereignty, Spain's identification with NATO will always be difficult, because another member of NATO, the United Kingdom, occupies land which the Spanish call the last colony subsisting on European soil.

Spain's entry into NATO was a result not of the Warsaw Pact threat but of a deep desire to share a Western European identity and be an active and integral part of Europe. Spain, in conjunction with France, Italy, the Federal Republic of Germany and the United Kingdom, forms part of the quintet of nations that possess 80 per cent of the population and territory of NATO's European part.

However, Spain will not form part of NATO's integrated military structure, in accordance with the government's view of 'cooperation without integration'. The Spanish Armed Forces, especially Navy and Air Force, cooperated with NATO and have been played important roles in NATO's exercises and maneuvers. Also, for a long time, the Spanish Air Force (SAF) has maintained an aircrew exchange program with other NATO countries, and the SAF air doctrine is in accordance with NATO.

The Iberian Peninsula, her Mediterranean and Atlantic islands and the Spanish cities of Ceuta and Melilla in the North of Africa, along with the surrounding air and maritime spaces, constitute, with the Britannic Islands, the only NATO zone of reaction for recovering Europe. It is located in the crossing zone between two exceptional and important axes. From East to

West it is the only way between the Mediterranean and the Atlantic. From North to South, it can be converted into a natural bridge between Europe and Africa or into a physical barrier, depending on the Spanish attitude. At the same time, the Iberia Strategic Space, delimited by the French peninsula of Britannia, the Azores islands, Madeira, the Canary islands, the Iberian Peninsula and the Balearic islands, represents the focal point the world's some of the most intense maritime and aerial traffic.

The Spanish Air Force has more than thirty-eight thousand men; eleven flying wings; an Alert and Control System operating twenty four hours a day, three hundred sixty five days a year; and an important and expensive program of modernization on course. The Spanish Air Force has a significant role in NATO.

This paper will look at the Spanish Air Force, analyze the threat, cover NATO's air defense in Europe and the Spanish Strategic Concept and finally deal with the actions of control in the air space and some conclusions.

## 2.- THE SPANISH AIR FORCE CURRENTLY (Appendix A)

The Spanish EJERCITO DEL AIRE (Air Force) is tasked by the Spanish Constitution with the following overall duty: 'To assure the sovereignty and independence of Spain, and to defend Spanish geographical integrity, and the Constitutional Order of the Nation' (Art. 8, Dec 1978)

Section III of the Defense Organic Act 6/80 and 1/84, Article 31 ordains the following:

a. The EJERCITO DEL AIRE holds the primary responsibility for the air defense of the Spanish territory and controls the air space under Spanish sovereignty. It is further tasked with the development of the Joint Strategic Planning within the scope defined by Air Force assets and by its own operational capabilities.

b. The EJERCITO DEL AIRE is structured into two sections: Air Force and Logistics. Basically, it comprises operational commands, Air Force units, Ground Service units, and secondary organizations suitably provided regarding the full compliance of duties which might evolve from its various responsibilities.

#### 2.1 The Air Force (Appendix B)

The Air Force is the operational arm of the EJERCITO DEL AIRE and contains the flying units of Spanish airpower. The Air Force must therefore have a capability to destroy or negate hostile air power to safeguard our country against aerospace attack and to support Army and Navy forces in their operations. The Air Force is tasked with planning, conducting and executing air operations, and also with the collection, evaluation, assessment and distribution of military-related information. It is directly subordinate to the Chief of the Air Staff, and includes the following major commands:

- \* Air Combat Command (MACOM)
- \* Tactical Air Command (MATAC)
- \* Air Transport Command (MATRA)
- \* Canary Islands Air Command (MACAN)

#### 2.1.1 The Air Combat Command (MACOM) (Appendix C)

The MACOM is the most effective means of deterrence in the Spanish Armed Forces, considering its particular area of operation (air and space) and the weapons systems used. Its tasks are:

- offensive and defensive air battle against aerospace attacks
- surveillance and control of the air space under Spanish national sovereignty
- achievement and preservation of air superiority
- destruction or negation of hostile air power
- support of the other Major Air Commands.

Five fighter wings are available to MACOM: the 11th Wing, located at Manises AFB (Valencia) equipped with Mirage-3; the 12th Wing at Torrejon AFB with Phantom F-4 (it will be replaced next year by EF-18); the 14th Wing at Los Llanos AFB (Albacete), with Mirage F-1; the 15th Wing at Zaragoza AFB, the most modern Spanish Air Force installation, with EF-18; and the Alert and Control Wing with nine different radar stations.

#### 2.1.2 The Tactical Air Command (MATAC) (Appendix D)

The MATAC has responsibility for air operations intended to support, cover, supplement and sustain operations, or those about to be initiated by surface forces. The nature of tactical weapon systems warrants their use against hostile air/naval/ground power; allows for coverage of Army and Navy units against hostile aerospace attack; and also provides for the reinforcement and sustainment of the operational capabilities of Army and Navy assets.

even to the point of replacement if required. The MATAC is assigned the following duties:

- to achieve and preserve air superiority in areas under its responsibility
- to destroy or negate hostile war power
- to support surface forces in any wartime operations required
- to assist the other major commands in the fulfillment of their specific duties.

The MATAC has the 21th Wing, at Moron AFB, with F-5s, the 22th Wing, at Jerez AFB, with P-3s and the 23th Wing, at Talavera la Real AFB (Badajoz), where the Fight and Attack School equipped with F-5s is located. Besides the three wings, the MATAC has the Air Control Group, the Air Support School and the Engineering Parachuting Squadron (Special Operations).

#### 2.1.3 The Air Transport Command (MATRA) (Appendix E)

The Air Transport Command carries out all military airlift mission required in the conduct of operations; supports (both in peacetime and in wartime) enhancement of the mobility of forces tasked with the air/surface battle; and speeds the logistic support to those forces in a timely manner and in locations other assets could never reach. Military airlift forces operate for the benefit of the entire Armed Forces and other National Defense agencies, both in peacetime and in wartime. Duties assigned to MATRA include:

- to perform military airlift duties
- to enhance the mobility of the Services

- to expedite the logistic support to the Services
- to contribute to peacetime deterrence, thus assisting in foreign policy matters.

Three Wings are integrated in the MATRA: the 31th Wing located at Zaragoza AFB with C-130s (some of them with refueling capability); the 35th Wing at Getafe AFB (Madrid), with C-212s, and the 37th Wing at Villanubla AFB (Valladolid), with Caribou (these aircraft will be replaced by C-235s in the near future).

#### 2.1.4 The Canary Islands Air Command (MACAN) (Appendix F)

Geographical considerations demanded the establishment of MACAN, which integrates the specific responsibilities of the above major commands. Within its assigned area of responsibility this Command performs the following duties:

- surveillance and control of the Canary Islands area air space
- defense of the Spanish territory against aerospace attacks
- destruction or negation of hostile war power
- support of surface forces
- military airlift support
- support to the other major air commands

The MACAM has only one Wing, the mixed 46th Wing at Gando AFB (Canarias), with F-1s and C-212s. It also has an Alert and Control Squadron with two radar stations and a Search and Rescue (SAR) Squadron with helicopters and Focker aircraft.

#### 3.- SPAIN'S GEOSTRATEGIC VALUE (Appendix G)

Spain's geography position is the main and decisive pre-

sent factor in the Spanish strategic value. Because of her situation, Spain is a part of Europe and a part of the West. She is maritime by her configuration and by her dependency on the sea. Also, because of her industrial development, she must be counted as a developing country.

Both archipelagos, Balearic and Canary, are outstanding actors of Spain's geography and strategy. Together, with the Strait of Gibraltar, they make up the national strategic axis. Galicia is the north-western vanguard. The Balearic islands are important, because from there it is possible to control the axis Sicily-Sardinia-Balearic and Tunisia-Sicily-Italy, the last one separating the oriental Mediterranean from the western Mediterranean. Practically, the Balearic islands are the geometric center of the western Mediterranean, a natural aircraft carrier from which the air-naval supremacy can be extended.

The Strait of Gibraltar is the only access from the Mediterranean to the Atlantic. Every year, according to Spanish Rear Admiral J. Salgado Alba, approximately 70,000 ships with more than eight hundred million tons of cargo, navigate the Strait (1:627). Eighty per cent of this traffic belongs to western nations, although some belongs to Soviet merchant as well as soviet war ships. The number of oil tankers transiting the Strait per year is 25,000 carrying 350 million tons of oil. Due to the width of the Strait, not more than nine NM, it is easy to control the maritime traffic.

The Canary Islands are an important strategic ally. Their

neighborhood covers two main world trade routes: from the Middle and Far East to Europe and America. From these islands, it is possible to control the strategic routes with the purpose of cutting the flow or safeguarding the sea from the threats.

Galicia is the prow of the peninsula aircraft carrier, an advanced guard of the maritime and air traffic, like an umbilical cord which joins Europe with America. If Europe is considered as a possible theater of operations, Spain must be a friend because from her position it would be easy to strangle a significant part of the logistic flow between both continents.

Finally, the peninsular territory is important, as a defense redoubt. The European theater needs a solid and secure rearguard zone, not only as a possible logistic base, but also as a zone of counteroffensive operations. The areas really important for the national strategy are located in the zones delimited by the parallels 48N and 23N and the meridians 23W and 7E. That means, the western Mediterranean and the Atlantic side which pass by the line Finisterre-Cape-Azores-Canary Islands-Gibraltar Strait. The intersection point of both zones is the Strait of Gibraltar; as a result, the strategy pivots here.

#### 4.- THE THREAT (Appendix H)

Spain considers the Warsaw Pact as the most dangerous threat in her Strategic Plan. That threat can be considered from two different perspectives: one as a direct threat and the other as an indirect threat, which could be carried out by the USSR

through the North of Africa.

In a generalized conflict in Europe, the Warsaw Pact forces would attack the NATO forces by an air-ground offensive through the Central Region, with two secondary attacks: one to the Baltic and the other to the South. The Iberian Peninsula could be threatened by the Soviet central progression, which, until it reaches the English Channel and the Pyrenees, will find only three important natural obstacles, all of them rivers: the Rhine, the Seine and the Loire. Likewise, Soviet naval action in the north flank stumbles over the blockade position of the British Isles which, together with Iceland, closes Soviet access to the Atlantic. As a result, it is only from the coasts of the Iberian Peninsula that the Soviets could frustrate the English blockade; and, it is only from Spanish territory could the blockade be opened. Only after a successful attack on Spain could the Soviets control the Strait of Gibraltar. The initial objective of the Warsaw Pact, if it is not possible to deny NATO's positive sea domain, is to prevent the arrival of North American reinforcements to the Iberian Peninsula. At the same time, they must repel any allied disembarkation which could serve as a reaction to start, ultimately, the recuperation of Western Europe.

According to Soviet doctrine, Soviet naval forces have the mission of displaying and reinforcing a nuclear strategic attack force, based in the Soviet ballistic missile submarine fleet; of protecting the Soviet Union against attack from NATO's

ballistic missile submarines; of supporting the ground forces in their European offensive and of cutting western supplies lines and destroying the Western merchant fleet. The Soviet objective is to prevent the arrival of energy products and food as well as reinforcements from the United States.

NATO's strategy is to deny the Soviet submarines access to the Atlantic, obligating the Soviet fleet to fall back to the north of the GIUK gap. But, what about the submarines which were deployed previously in the Atlantic or which had departed previously from the Mediterranean to the Atlantic?. On September 18, 1984, a Soviet SSN class Viktor II submarine, collided with the ship Bratsvo when, in order not to be detected, it sailed under that ship through the Strait of Gibraltar.

Another serious threat is mines. Before the outbreak of hostilities, the Soviet navy will carry out large scale mining operations mainly in the area of the Strait of Gibraltar and in other zones of the Iberian Maritime Space. Their purpose will be to intimidate, disorganize or, at least, delay the reinforcement and supply of Europe. As Rear Admiral Thomas A. Brooks, US Navy, says: 'The US does not possess the necessary number of units to provide escorts, to watch over access to Europe and to keep traffic open in strategic points such as Gibraltar' (2:720).

Perhaps, the most dangerous threat against the Iberia Strategic Space coming from the East will be represented by the new Soviet bombers: Backfire C and the turboprop Bear H. They are capable of launching the AS-15 cruise missile with a 3000 km

range. Before finishing this decade, the new supersonic bomber Blackjack, bigger than the B-1B, will be in service and be able to launch not only the AS-15 but also a new supersonic cruise missile, still in development. The Soviet Air Force has greater capacity transport planes, like the A-124 Condor and the AWACS derived from the Il-76 Candid. The air defense systems from Western Europe are oriented to the East but, the new generation of Soviet bombers will be able to attack from any direction. The new variant of the Fencer attack aircraft and the introduction of the Midas tanker, will enable the Soviets to increase the range of the bomber.

The Soviet Air Navy would carry out antisubmarine operations in the area of the Strait of Gibraltar and in the Atlantic. The Soviets would do massive mining of the Sea Lines of Communication (SLOCs) and could attack the aeronaval groups and other surface maritime forces. The Soviet Air Force could carry out massive attacks against the peninsula air defenses, air and navy installations and all the other objectives which could be used to receive and transport reinforcements to the European theater. They could make these attacks with the bombers through the Mediterranean and North Africa as well as with the Fencer, and follow on aircraft, from occupied France.

A serious threat to NATO's south flank, which could be much more effective and less expensive for the Warsaw Pact, might involve destabilization of weak political regimes in some of the countries in North Africa. If, as a consequence of So-

viet subversion, Morocco's King were dethroned, a crisis of unforeseeable consequences could be opened, particularly if the new regime had the same orientation as Colonel Qaddafi's. This indirect threat could facilitate the deployment of the Soviet aeronaval forces in the western Mediterranean and in the Atlantic. This is the reason Spain has reinforced her military presence in the southern part of the peninsula as well as in the Balearic and Canary islands. A close cooperation between Morocco and Spain, to preserve peace and security in the area for the West's benefit, is one political constant for the Spanish government. The Soviet strategy in Africa is part of a long term plan in which the periodic presence of aeronaval groups and the establishment of non-economical air routes by Aeroflot are not by chance. The Canary islands are located in front of an African space empty of power and are of great strategic importance. This African space deals with the Sahara corridor which divides Africa in two parts and which begins in the Indian ocean and passes through Eritrea and the Sahara, finishing in the Atlantic. It is a strip 200 km wide: an authentic strategic hollow, due to the weakness and slowness of the countries which occupy it. That air corridor performed an important role during the Angola crisis. The Soviets had to fly their transport aircraft through this air corridor. The Soviets projected political and military power along the Atlantic coast and sea without being detected by NATO's alert systems. For this reason Spain developed an advanced air defense system in the Canary Islands, known as ALERCAN, which

will be able to detect, when it becomes operational, in 1990, any air raid in all of the azimuths and at any altitude for a radius of 250 nautical miles around the archipelago.

#### 5.- SDI INFLUENCE IN EUROPEAN STRATEGIC CONCEPT

European governments did not respond enthusiastically when ex-President Reagan announced the Strategic Defense Initiative (SDI) in 1983. SDI provoked in Europe, disquiet and confusion, especially in France and England. The strategic military balance in Europe was changing because Mutual Assured Destruction (MAD) was being replaced by Mutual Assured Security (MAS). That means, a progressive replacement of the vulnerability equilibrium by an invulnerability balance, based on gradual introduction of special defensive and offensive means in the strategic arsenal. Why has SDI had such an impact on European Strategic Thinking?

- First, SDI is thought to be more for the United States's defense than for Europe's defense. In the other hand, SDI is not seen as a perfect defense. SDI will not lead to perfect defense which makes "impotent and obsolete" the nuclear arsenal of the world. But, as a defensive system, with possible high effectiveness it can significantly alter strategic nuclear strategies. It brings defensive and offensive actions together reducing the freedom of action of Intercontinental Ballistic Missiles (ICBM) and Sea Launched Ballistic Missiles (SLBM).

That is a matter of preoccupation for Europeans because

they fear the Soviets will develop a space defensive system similar to American one that could affect, drastically, the deterrent value of the European strategic arsenals. Because the physical proximity and the commensurate flighttimes of Soviet nuclear warheads into Western Europe, a lot of those warheads could avoid an SDI system and reach their objectives. This increases Europe's vulnerability.

- Second, European strategists worry more about planes with nuclear armament and SS-21, SS-22 and SS-23 cruise missiles with tactical nuclear heads than the SS-18, SS-19 and SS-20 Soviet missiles which should be neutralized by SDI. Europe will be always vulnerable to this type of armament due to USSR's proximity. SDI will be a defensive umbrella for Europe; but, with enormous leaks.

- Finally, we can postulate an increasing armament race due to SDI incentives to increase the number of offensive systems to compensate for expected losses to an SDI system.

So, the European nuclear strategic capability which is the basis of its deterrence, will be reduced and in so doing directly affect the European Strategic posture. That will not only force reconsideration of England's Defense Policy; but, also the end of the independence of the French Defense Policy. As an example, we must remember the last approach of France to NATO and, directly to Germany. This country, together with France, can form the 'European pillar' for the common defense of the old continent. The former French Minister of Defense, Mr.

Charles Hernu, offered to Germany the protection of a French nuclear umbrella.

Europe is concerned by the perception that her future security depends exclusively on the United States because the United States has never guaranteed a nuclear retaliation against Soviets vital points in Europe's defense. That means that Europeans question whether the United States will sacrifice New York for Bonn or Paris.

France proposed the Eureka project to the European Economic Community members in July 1985 in Milan (Italy). This project has the objective of joining efforts, avoiding duplication in research and development and coordinating Europeans scientific potential. The big difference between SDI and Eureka is that the first pursues a military objective from which civilian applications can be derived. Eureka starts from a scientific and technological objective with military applications in the future.

If the Eureka project succeeds, the European Strategic Concept would be based on nuclear deterrence. If not, Europe would be divided into several States-Defenses with reduced capability of strategic retaliation and lower potential for generating her own defense.

#### 6.- SPAIN AND ARMS REDUCTION

Spanish Government Policy supports reducing the arms race to the lower levels, compatible with maintaining deter-

rence, strategic stability and Spanish national sovereignty. In this way, Spain considers disarmament policy as another element of security policy together with deterrence, defense and dis-tension.

The Spanish government has stated that it considers the signing of the INF treaty as a positive step. For missiles of range below 500 kilometers, Madrid has stated that negotiations for eliminating them must be postponed until compliance with INF treaty is shown and until some talks about chemical and conventional arms elimination are held.

In other discussed areas, Spain maintains a favorable attitude on ABM systems regulation between US and USSR and it contemplates SDI with fear. Why? Because the government believes space weapons will lead to a new unbridled race of science-fiction in the cosmos.

The government has demonstrated interest in the control of ASAT (Anti Satellite Arms Systems) for which testing has been cancelled in the USSR since 1982 and forbidden against real targets by US Congress.

Finally, with respect to START (Strategic Arms Treaty), Spain supports the agreement to reduce by fifty per cent the existing strategic arsenals while sustaining, at the same time, the idea of concluding a total treaty forbidding nuclear weapons.

The whole of Spanish diplomatic attitudes refers to disarmament along with a United Nations defense role as the best

net to guarantee world peace. The UN, as the Spanish government sees its, is the supreme frame -although not the only one- for general disarmament and cooperation between nations.

#### 7.- NATO'S AIR DEFENSE IN EUROPE

To face the Warsaw Pact threat, NATO has developed an air defense concept based on a group of radar stations and control centers from Norway to Turkey, called NADGE (NATO Air Defense Ground Environment). The NAEWS (NATO Early Warning System) works together with a "five cloak" defense, composed of the following weapon systems:

- \* SHORAD (Short Range Air Defense System)
- \* Surface to Air Missiles (SAM) in the zone next to the Warsaw Pact border
- \* Air Defense Air Force Aircraft
- \* NIKE missiles in the Rear zone
- \* Point defense or defense of vital zones of minor importance

Each nation's assets integrated in NADGE controls its own defense sector, because the forces and the weapon systems remain, in peacetime, under national control with SHAPE's supervision. The moment that a threat appears and it becomes necessary to activate the allied defense, these assets chop to SACEUR who will control the system.

#### 8.- STRATEGIC SPACE OF NATIONAL INTEREST

Each country has the right and duty to exercise control

of the air within the limits of its sovereignty. Spanish Organic Law 6/1980, currently the highest ranking legal text in effect, establishes that the Air Force has main responsibility for air defense of the territory and for control of the National Sovereignty air space.

The Strategic Space of National Interest (Appendix I) is defined as that extensive geographic area where events that affect the sovereignty or the defense of national territory, can take place. This space, in Spain's case, includes:

- the Spanish peninsula territory
  - the Balearic archipelago
  - the Canary archipelago
  - the Spanish cities of Ceuta and Melilla
  - the Strait of Gibraltar and its access points
  - the Exclusive Economic Zone (ZEE)
  - the air and sea spaces, not included in those of the sovereignty and the ZEE, that constitute the points of union between the Strait of Gibraltar and the two archipelagos.
  - the spaces that form natural routes of access to national territories. The strategic space that satisfies Spain's national interests is the area between the latitudes of Brest and the Tropic of Cancer and the longitudes of Corsica and the Azores.
- This space is divided into four main zones:

ZONE A : includes the Western Mediterranean's land/sea spaces, from the longitude of Corsica to the Strait of Gibraltar's eastern access points.

ZONE B : consists of the Strait of Gibraltar and its point of entry.

ZONE C : covers the Canary archipelago's strategic space to their union with the Strait of Gibraltar's western access.

ZONE D : contains the Bay of Biscay and the part joining the Atlantic ocean.

#### 8.1. Analysis of the different zones

ZONE A : The Mediterranean's Western shore, with the Balearic Islands in the center, is one of the most important strategic areas for Spain; she not only has to defend its sovereign territory in this area, the Balearic archipelago, but also has to exert control of the air space in the area to prevent attacks on the peninsula territory and the Spanish cities, Ceuta and Melilla.

Spain, as a NATO ally, will exercise control of this area and perform naval and air operations, if needed, to oppose a threat from the Warsaw Pact. However, today the Iberian peninsula is considered a logistic rearguard base. The Mediterranean sea is a geographic area of much logistical interest but minor operative value, the extent of which could only be discovered from a ship and aircraft battle between the US and USSR fleets. The hypothetical battle does not seem to be as important as the possibility of the Warsaw Pact's simultaneous attack on Central Europe and also from North Africa. If this attack took place, the Iberian peninsula would convert quickly into a theater of operations. This area has superimposed interests of an individu

al nature for other nations, such as France and Italy in the NW and SW quadrants, North Africa countries in the SE and SW quadrants, and the US in the entire area.

ZONE B : The Strait of Gibraltar is the intersection point of two axes. Control of this strait is fundamental for Spain's defense interests in the presence of its particular and hypothetical threat. It is also vital for sending reinforcements and supplies to Western Europe in a critical situation. A blockade of the Strait could plunge the European economy into a profound crisis and also paralyze its war industry. The area could likewise be of interest to other European countries, as well as US and North Africa countries.

ZONE C : Its fundamental characteristic is the great area it covers. In it are located the Canary archipelago and the passage way that connects it to the Strait of Gibraltar's approaches and to the Iberian peninsula. Spain must have air control over this area, in order to guarantee the flow of transportation and the connection between the two parts of her national territory.

For the benefit of NATO, control and military defense must be imposed in these air and sea spaces. These two factors, the Canary strategic point and the Spanish military cooperation in NATO's heart, are fundamental for the Alliance because they help to control the Strait of Gibraltar and assure the supply of essential materials. This action supports the war efforts and, at the same time, provides fast reinforcements when needed. The US, Morocco, Mauritania and the Warsaw Pact have individual inter-

ests in this area.

ZONE D : This zone is also characterized by its large area. It comprises a geographic area that affects the space of strategic interest for various allied countries, at present, France and Great Britain. Controlling this zone is important for NATO because it serves as the main access route for the traffic headed toward the British Isles and Central and Northern Europe. This area could also be one of the hottest points in the theater of operations in terms of an air-sea battle. The Warsaw Pact threat has at its disposal some very long range aircraft and missiles and many other planes with a lesser radius of action. These short range aircraft could, however, be refueled in flight to extend their range. Also, their attacks could originate from a number of distant locations, using land bases or carrier aircraft.

#### 9.- SPANISH STRATEGIC CONCEPT

Spain will maintain the peace, insuring the stability of the described zones, and will see to the security and defense of the Western world by means of deterrence, defense of its territory and zones of interest, and the adequate response to possible aggression. The Spanish military participation in NATO, recently defined by the Spanish government and accepted by the Alliance, is narrowed down to the following points:

- defense of Spanish territory and the national air space
- control of the Strait of Gibraltar

- air and naval operations in the Western Mediterranean and the Eastern Atlantic
- Spain as a logistical rearguard base

The Spanish Air Force must be able to contribute to deterrence by fulfilling the following criteria:

- possessing sufficient force so that a possible aggressor will cease attacking.
- having the capacity to absorb and cushion the attack's effects and execute a retaliation that allows an adequate response.
- having a resolved and unswerving will to use that force
- convincing the enemy that force will be used if necessary
- contributing to the control and the management of the crisis

In case of war, the Spanish Air Force must contribute by reaching and maintaining a favorable air situation that allows control of air space in order to guarantee the effective development of military operations. Therefore, the capacity to exert control in its air spaces in the presence of any situation -with speed and at a distance of required safety- is believed to be an indispensable factor in the precise development and fulfillment of the previously explained strategic concept.

#### 9.1 Difficulties for Spain's Air Defense

Spain's defense is extremely complicated, due to the following reasons:

- Spain is essentially a coastal country and is the second largest country, in land area in Western Europe, which gives it an extensive coast line and borders. This fact makes it almost

impossible to have one defense mechanism that adequately covers the whole territory.

- The very mountainous geography makes radar detection very difficult from ground stations.
- The uneven distribution of the density of population and parallel, the location of industry.
- The existence of the two archipelagos, because of their strategic value as authentic aircraft carriers, force the always scarce means of defense to be distributed. The Canary Islands are, in comparison with the African coast, so distant from the peninsula (the African coast is only 9 NM. from Spain).
- Ceuta and Melilla, in spite of being near the peninsula territory present a very complicated defensive problem, because of their relative isolation and reduced size, which made very difficult the use of defense means.

#### 9.2 Elements necessary for exercising control

To maintain control, the following must be available:

- a) an organization based on the Command Unit principles, that permits a balanced distribution of the air effort, according to operative needs, in offensive or defensive actions. This organization should respond to an idea of unified action assuring the system's efficient and effective direction and coordination, in order to be able to make quick decisions in the control of the considered air space.
- b) offensive systems (bombers, fighter-bombers, etc) and defensive (fighter-interceptors, AAA, and SAM) arms properly inte-

grated. If integration is not possible, they should be coordinated to a maximum degree, not only among the groups but also among each element of those groups in order to have efficient control of the air space.

- c) a system of command, control, communications, and intelligence (C3I), that permits the knowledge of a real life situation to get where it is needed at the command level.
- d) a logistics system that allows establishing and maintaining the force's combat capability.

All this must work perfectly to carry out not only actions of pure, direct defense but also simultaneous actions of deliberate response. The latter should have the purpose of neutralizing the aggression, increasing and controlling the intensity of the response, so that the aggressor's risk becomes disproportionate to the objectives he is trying to reach.

#### 10.- THE SPANISH MILITARY CONTRIBUTION TO NATO (Appendix J)

The Spanish military contribution to NATO is considered similar to the national positions of some countries, like Great Britain, France and Portugal: three countries with different forms of cooperation, but still exercising national sovereignty. Spanish participation will be carried out according to certain coordinated plans which will be formulated and established between the Spanish Defense Staff and the affected Allied Commands. The basic criteria that the Coordination Plans will be based upon are the following:

- a. Spain retains control of the strategic space of national interest.
- b. The Spanish Armed Forces exert control over the strategic space Balearic-Peninsula-Canary, without participating in the Gibraltar Command.
- c. Spain retains the right of assigning her own forces and if necessary would do it according to the Coordination Plans.

These criteria originate from the following unrenounced national security principles for Spain:

- a. National sovereignty
- b. Control of the Strait of Gibraltar and its access.
- c. Control of the air space of Spain's responsibility and interest.
- d. Sea control in the Balearic-Peninsula-Canary islands and adjacent maritime zones.

As a consequence, defense of the national territory will be the first mission for the armed forces, the same as for the allied countries, because it constitutes a mission which affects the security of the rest of the Alliance. Certainly, its defense presupposes a valuable contribution, not only to protect a region of great strategic importance, but to guarantee vital zones which give depth to Europe's defense. The primary role of the Air Defense Forces will be the preservation of the integrity of the Spanish air space in conjunction with the Ground Forces, with the coordination of the Portuguese Air Defense System and the French SICCAP and STRIDA. It constitutes an essential contribution which

will require cooperation with the nearest countries inside NATO Europe's concept. For this mission Spain could mount a defense with EF-18s, Mirages, EFAs/ACEs, etc.

Elsewhere, the most efficient military contribution that Spain can make would consist of the coordination of the naval and air missions with those of the Alliance to control the access and the movement of the naval and air reinforcements to and from Western Europe, in particular in the Canary-Peninsula-Balearic area. Spain has offered to contribute to the defense and control of the zones of high strategic value by means of Coordination Plans. Although the zones are the Alliance's responsibility, Spain's contribution to their defense and control will add new perspectives to the Alliance and allow the responsibilities to be shared.

The Spanish government, according to an invitation from the Western European Union (WEU), initiated conversations to join this organization and today is a formal member. The government assumes that the WEU is a decisive instrument for European unity, as well as a fundamental means for its defense, but has never considered it an alternative to NATO. The Spanish government shares the objectives and aims established by WEU in the modified Treaty of Brussels of 1954 and by the Rome Declaration of 1984. Spain accepts, without reservation, the 'Platform about European's security interests' adopted by WEU in October 1987, which established some criteria already assumed by Spain in NATO. The only reservation Spain has formulated is with Arti-

cle 10 of the Brussels's Treaty, concerning the Spanish position about Gibraltar. In this form, it can possibly be appealed to the International Justice Tribunal.

### III.- ACTIONS OF CONTROL IN THE AIR SPACE

The Combat Air Command (MACOM) and the Canary Air Command (MACAN) have, in their respective geographic areas of responsibility, among other duties, the control of air space to prevent its use by any unauthorized or hostile military or civil aircraft and to facilitate its use by those aircraft that are friendly. In time of peace or a critical situation, that capacity is represented by all those material and human means, suitable to supervising, detecting, identifying, intercepting and, as a last resort, intervening in air traffic. The mentioned capacity is also represented by the weapon and vector systems, capable of denying use of Spanish air space to any undesirable aircraft.

Both Commands are also assigned to carry out the Air Battle or 'Counter Air' Battle, in NATO terminology. This entails executing defensive and offensive air operations necessary to gain control, if we do not have control, and maintain it.

It should be mentioned that NATO air doctrine (ATP,s 33/B and 42) and the Spanish air doctrine (IG-00-01) are quite similar; however, there is a concept in the Spanish air doctrine not considered in the Alliance's. It refers to offensive air operations, which are directed against the enemy's power and air potential before its aircraft or missiles have left their em-

placements. The Air Force's IG-00-01, perhaps to respect to a higher degree the defensive stand criteria adopted by the Spanish government, considers the offensive operations also as indirect air defense. And so it is, because even though the initiative may be ours, the operations are in the end, impeding in an indirect way, future enemy air attacks aimed at us. They are, therefore, more a form of defense.

This indirect air defense likewise includes all those other activities that, in time of peace or situations of crisis or war, succeed in preventing enemy attacks. These activities can be political (agreements, pacts, etc) or military (demonstrations of force, attacks of regular or irregular force on an enemy air base, etc).

#### 12.- DEVELOPMENT OF CONTROL IN SPANISH STRATEGIC AREAS

Spain, in accordance with its defense policy, is primarily responsible for the defense of its unshared interests in this area and of NATO's interests. The far-reaching nature of the Spanish Armed Forces' assigned mission to safeguard the nation's sovereignty, independence and territorial integrity and the consequential importance of control of the air space makes it necessary to develop and keep current appropriate means in areas of interest to Spain, which have already been seen to coincide with some areas of NATO interest. The strategic value of that control will evolve in accordance with the possible military or political threats that could materialize.

For Spain and for the Atlantic Alliance, the value of air control is very high in the Western Mediterranean, the Strait of Gibraltar, Eastern Atlantic, and of course, the Spanish peninsular territory. With respect to the Spanish peninsular territory, the Balearic archipelago and the Strait of Gibraltar zone, will integrate in the near future radar installations and Spanish Air Bases into NATO's networks of Alert and Control. This action will bring to the entire Western defense an amplitude and defense capacity of capital importance. At the present it is difficult to coordinate the operations that could be carried out in the Canary archipelago defense system with those of the Atlantic Alliance due to the archipelago's distance from the peninsular territory.

Nevertheless, being able to have a high degree of control in this air space is fundamental, if Spain wants to be able to defend this part of the national territory. It is also necessary to guarantee the traffic in the Atlantic's routes through our neighborhood when, in a time of crisis or war, NATO must have allied North American reinforcements and logistics coming, especially if we were not able to use the Mediterranean route.

### 13.- AIR CONTROL IN THE YEAR 2000

The year 2000, since it is relatively near, does not leave much margin for a substantial change in the type of threat and the means that a possible enemy could use. This is especially true if we observe that a new weapons system requires a mini-

mum of ten to fifteen years from the time of its definition to its operational deployment.

However, the Eastern threat does not need to turn to theater or intercontinental missiles: it already can use the Backfire C supersonic bombers and the Bear H turboprop. The Bear H is capable of launching the AS-15 cruiser missile from a distance of 3000 kilometers. Also, the Blackjack supersonic bomber is capable of launching the cited AS-15 missile from a distance of 7000 kilometers.

We must presuppose that any point in the Strategic Space of National Interest, including the Canary Islands, will be within easy reach for Soviet airpower. We also must consider that an attack from the Warsaw Pact could come from the African continent. If Spain is currently considered a rearguard logistic base, in the close future it could become part of a theater of operations, possibly at the same time or sequentially with Central Europe's theater.

With respect to the technological prospecting for arms systems which logically implies a very high cost, economically difficult for most states to afford, unless their survival is at stake, the following offensive aspects should be taken into account:

- Greater facility and safety in penetrating hostile territory, using advanced systems of active and passive electronic warfare.
- Greater precision in all weather systems of navigation and attack

- Greater capacity in the system for suppression of defenses, with lesser need for means used.
- Increase in unconventional war actions (special operations) against C3 systems, installation of combat support and key personnel in the political arena and the direction of operations.- Improvements in ability to recognize an unsuitable air strategy situation.
- Improvements in the ability to detect and identify all kind of aircraft, mainly in time of tension, crisis or war.
- Greater effectiveness in all types of defense systems.
- Better protection of the C3 systems against destructive attacks by increasing the passive defense measures against interferences of these systems, and against their safety conditions.

In brief, the Spanish Air Force is improving its capabilities in the vigilance and control of Spain's strategic area of responsibility, with better sensors of identification, with the modernization of the informatic system and the increasing interoperability with other countries.

This integral vigilance system will also accept information received from other armed forces naval or lands means, in an effort channeled through a truly unified action.

#### 14.- BUT, AT THE END, ALWAYS THE MAN ...

The old principles of "si vis pacem para bellum" or "securitas pacis", could be substituted today by "si vis pacem sostenere equilibrium" -if you like peace, keep the balance-. The

longest period of peace known in Western history, for the past half century, is due to the balance achieved between the two international blocks Ideological enemies, they have persisted with different degrees of tension-distension in a diplomatic and military counterbalance sufficient to avoid direct conflicts. The balance upon which peace depends, in spite of the existence of tensions between two incompatible and different conceptions of politics and economics, is a matter for politicians, military leaders, and diplomats who, after WWII, assumed with full conscience the responsibility of conquering peace, every day.

The Spanish Air Force has an inventory of approximately 630 planes and helicopters, of which about 250 are fighters, with two squadrons of EF-18 and a series of plans to modernize and acquire new planes: one hundred of which are the EFA/ACE (European Fighter Aircraft, Appendix k). But the most important part of our inventory is almost 39,000 men who serve permanently. They can play a vital role in NATO. They have the capacity to employ and to deploy our arms systems. They know how to use the material that the nation has put in their hands. They belong to the West and they want to defend the culture, the people, and the Western way of life.

#### 15.- CONCLUSIONS

This paper overviews the geostrategic importance of the Iberian Peninsula and its archipelagos in Europe's defense. That importance has been increased with the entrance of Spain into

NATO. It has presented historical, geopolitical and purely military arguments, all of them based on objective and balanced criteria. Spain's geostrategic importance has been increased since the INF treaty in Europe with the development of new Soviet arm systems. These systems include the Blackjack strategic bomber; the incorporation into the Soviet Air Force of greater capacity transport planes, like the A-124 Condor, the new refueling versions and the AWACS derived from the Il-76 Candid; as well as the construction of the first nuclear aircraft carrier which will be in service at the beginning of the 1990's. Such technological developments will provide to the Soviets a capacity for military influence in the world. For these reasons, the entrance and permanence of the Iberian Peninsula, her islands and aeromaritime spaces, inside the Atlantic Alliance have strategic and military value over the single political aspect. The prophetic words of Salvador de Madariaga can be applied to Iberian Strategic Space: "A look to the map shows that Spain has great and natural geopolitical advantages: so great that a strong Spain could play an important role in the world while the great powers will never miss the sight of a weak Spain" (3:176).

The recognition of the strategic importance of Iberian Peninsula by the allies has been confirmed with the formal invitation and, later, entrance of Spain into the Western European Union.

On the other hand, politically, Spain has joined NATO at a very opportune time for the Alliance. Dissensions and discrep-

ancies between the state members, as well as some leadership differences between the US and her European allies, had damaged not only the prestige but also NATO'S internal cohesion. The voluntary adhesion of a new member represented a reinforcement of great morale and military value which fortified NATO's spirit.

The Iberian Peninsula and her islands represent a bulwark of resistance in front of a Soviet invasion through Central Europe, a logistic base and the reaction zone to begin the recuperation of lost territories, and an influence platform for naval power able to deny to USSR the supremacy and control of Atlantic and Mediterranean air and maritime spaces. From the Peninsula and her archipelagos the Atlantic security enjoys valuable support in air naval actions, particularly from air forces based on land. The modern air systems applied to the Spanish Air Force, increased with modernization plans, will project hundreds of kilometers from their bases, a powerful attack force with a capacity of destroying, in the air or on the surface, any kind of objectives.

The control of the Strait of Gibraltar is a matter of Spain's exclusively; so it is difficult for Spain to understand or accept any kind of British responsibility in the zone, for either political considerations or geostrategic reasons. Great Britain and Spain will coordinate their miliary actions in the Strait of Gibraltar through SACEUR and SANCLANT. This agreement was signed last April by the Minister of Defense of both nations

So, Spanish non-recognition of Gibraltar Command (GIBMED) is not an obstacle to Spain's military contribution to the allied Defense effort.

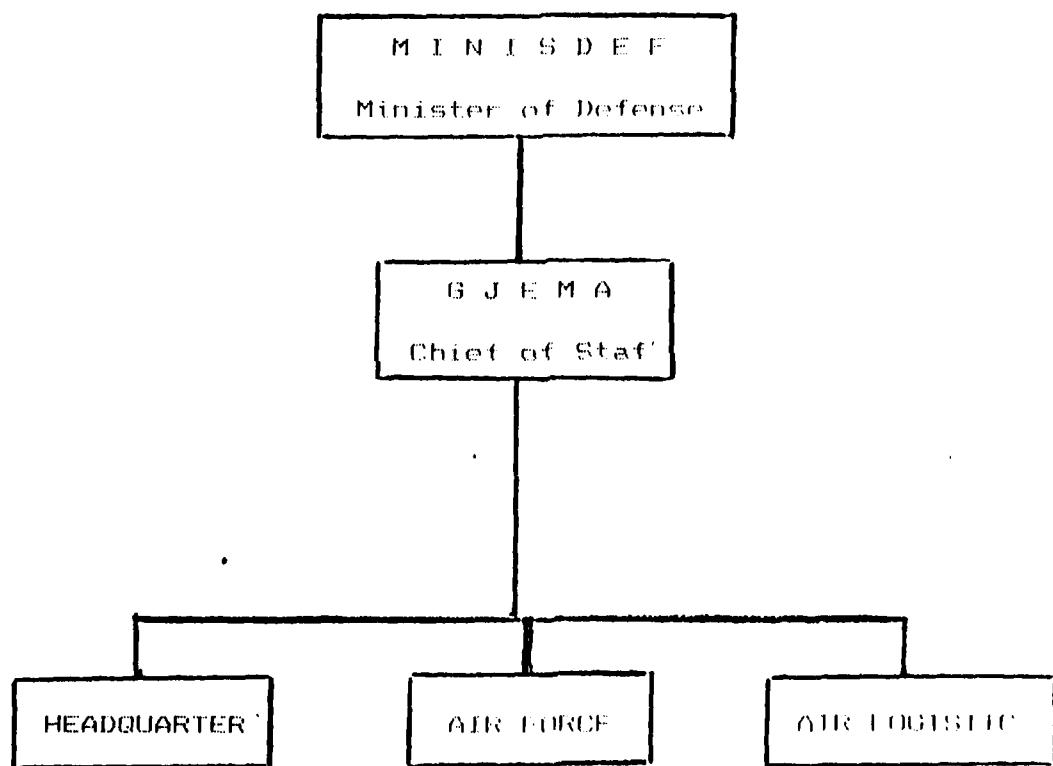
Hopefully, great advances in the vigilance and control of the space of the strategic areas under Spanish responsibility will result from improvements in sensors of identification, in the modernization of the informatic system that supports them, and greater interoperability with other countries.

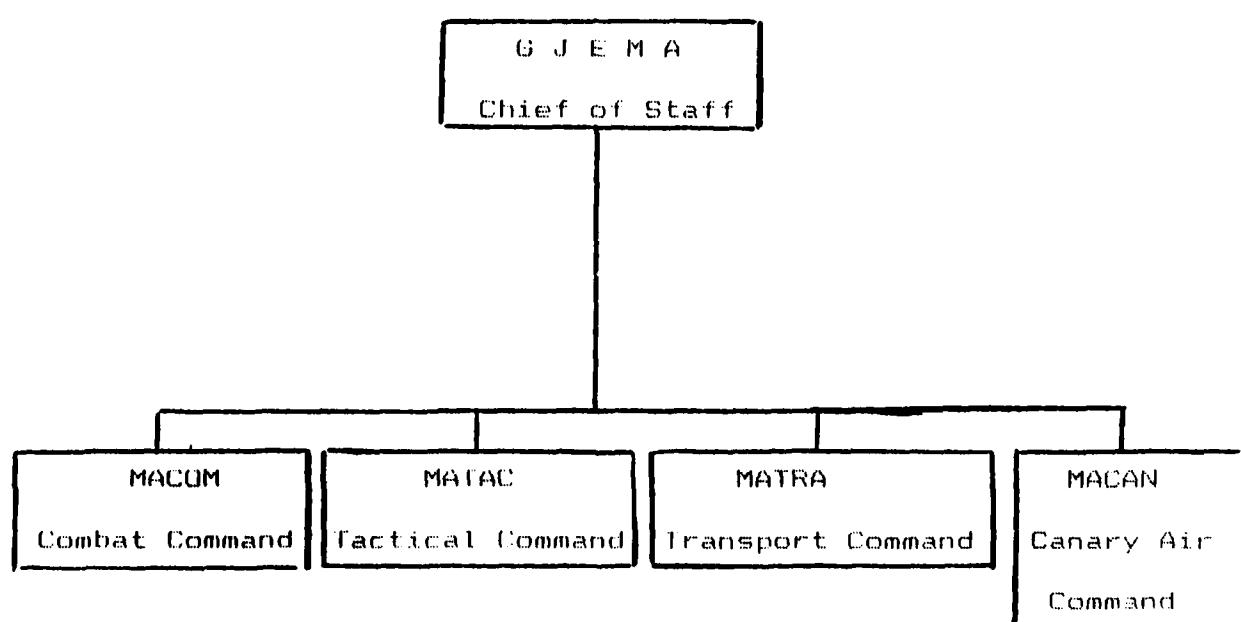
The Spanish Air Force is ready to play her role in the Atlantic Alliance: a role with the same capacities as the other countries and importance, due to the strategic position of the Iberian Peninsula. Spain has and has always had an authentic European vocation. The year 2000 is coming. It should be a good opportunity to demonstrate readiness.

APPENDICES

THE SPANISH AIR FORCE CURRENTLY

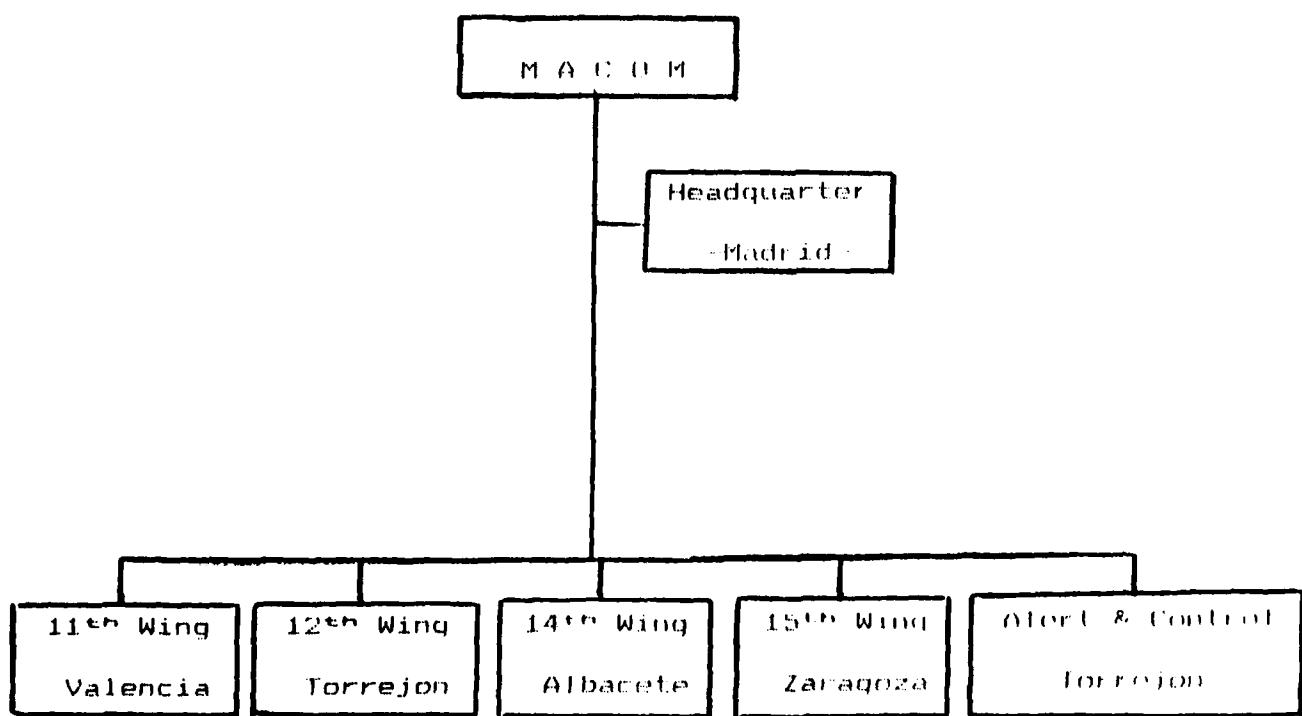
APPENDIX 6





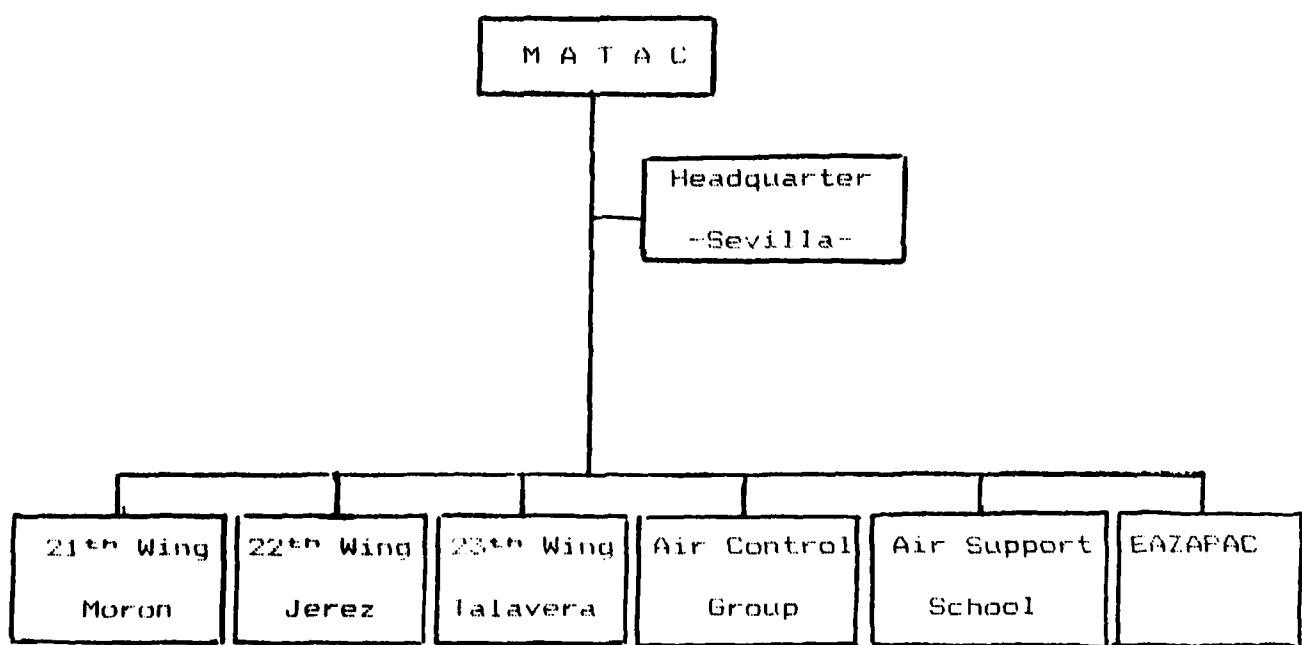
MACOM (Combat Command)

APPENDIX C



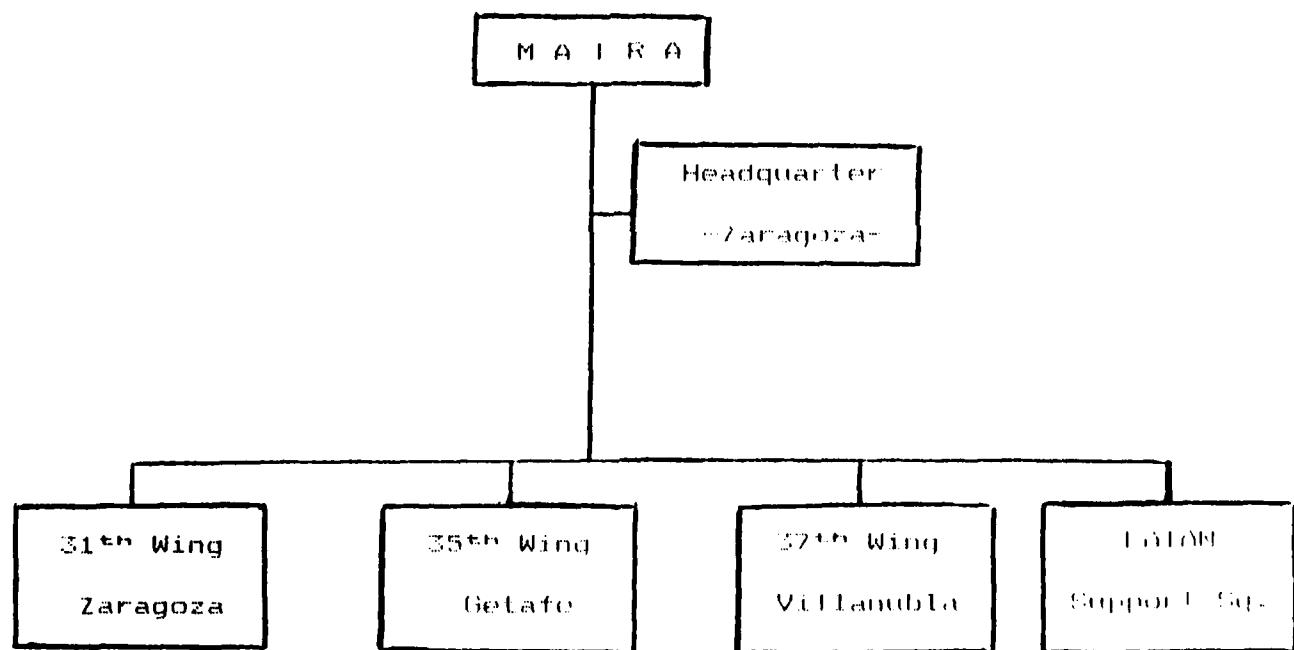
MATAC (Tactical Command)

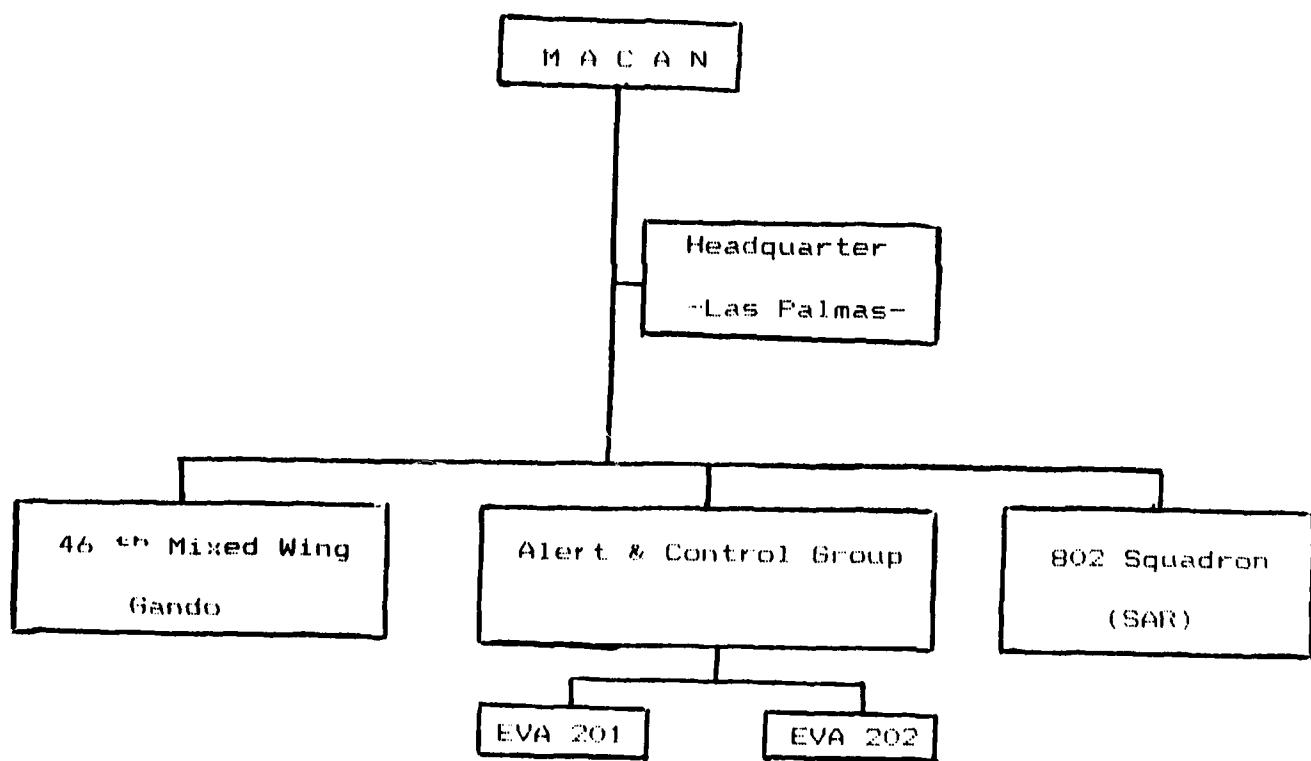
APPENDIX D



MATRA (Air Transport Command)

APPENDIX E



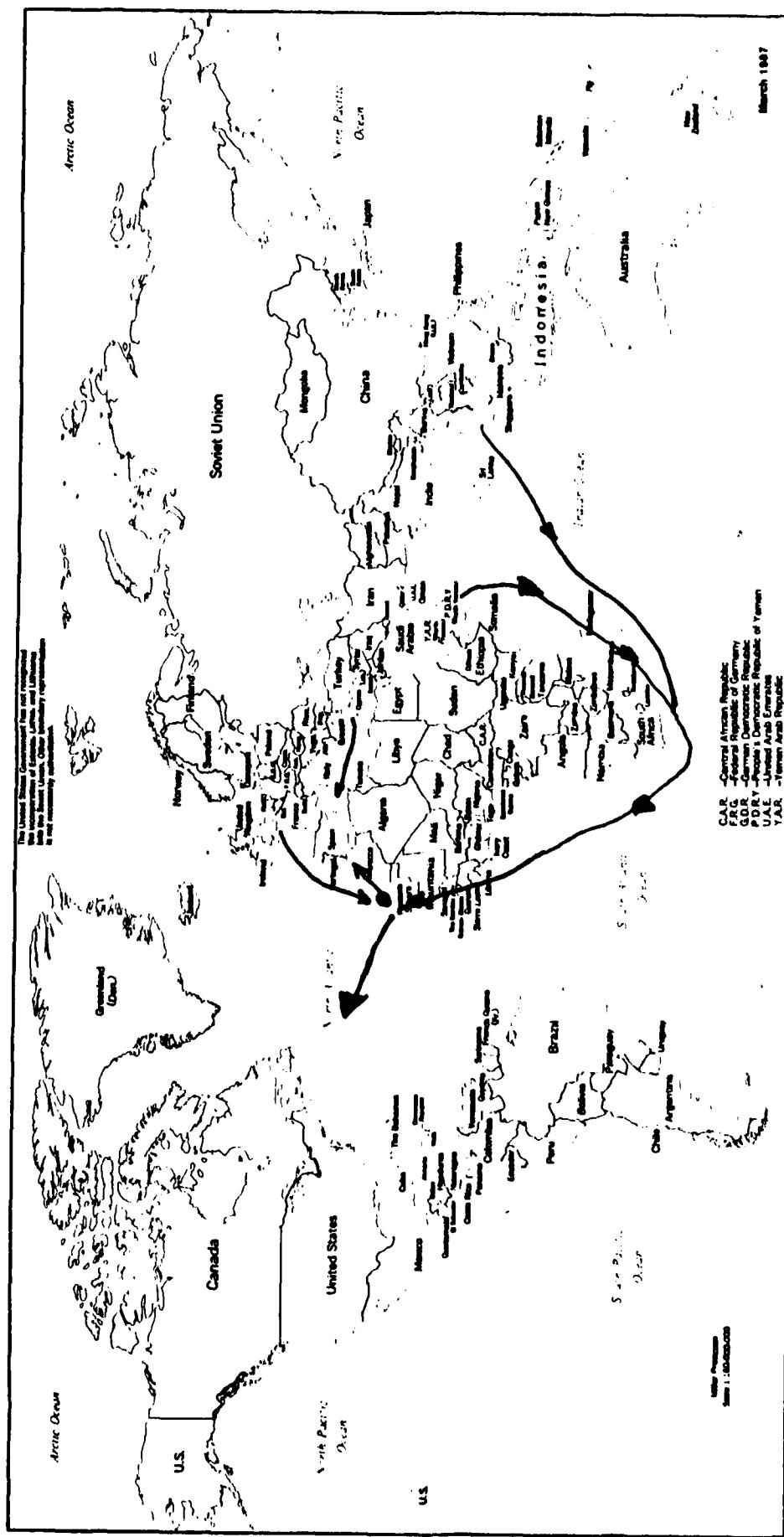


## SPAIN'S GEOSTRATEGIC VALUE

## Appendix G

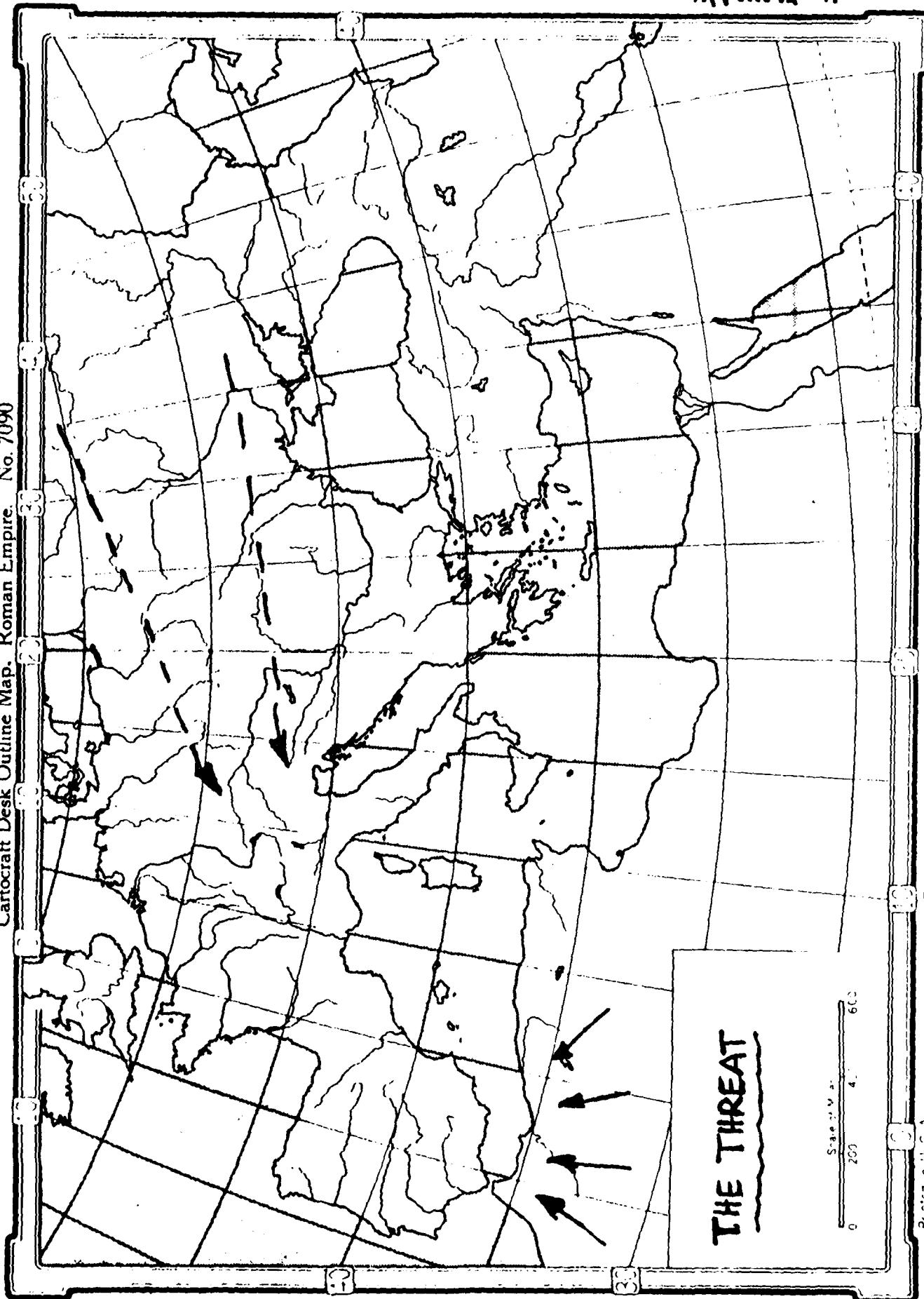
100-241M101813-07

MIDDLE AND FAR EAST TRADE ROUTES  
CAN BE CONTROLLED FROM CANARY ISLANDS



## APPENDIX H

Cartocraft Desk Outline Map. Roman Empire. No. 7090

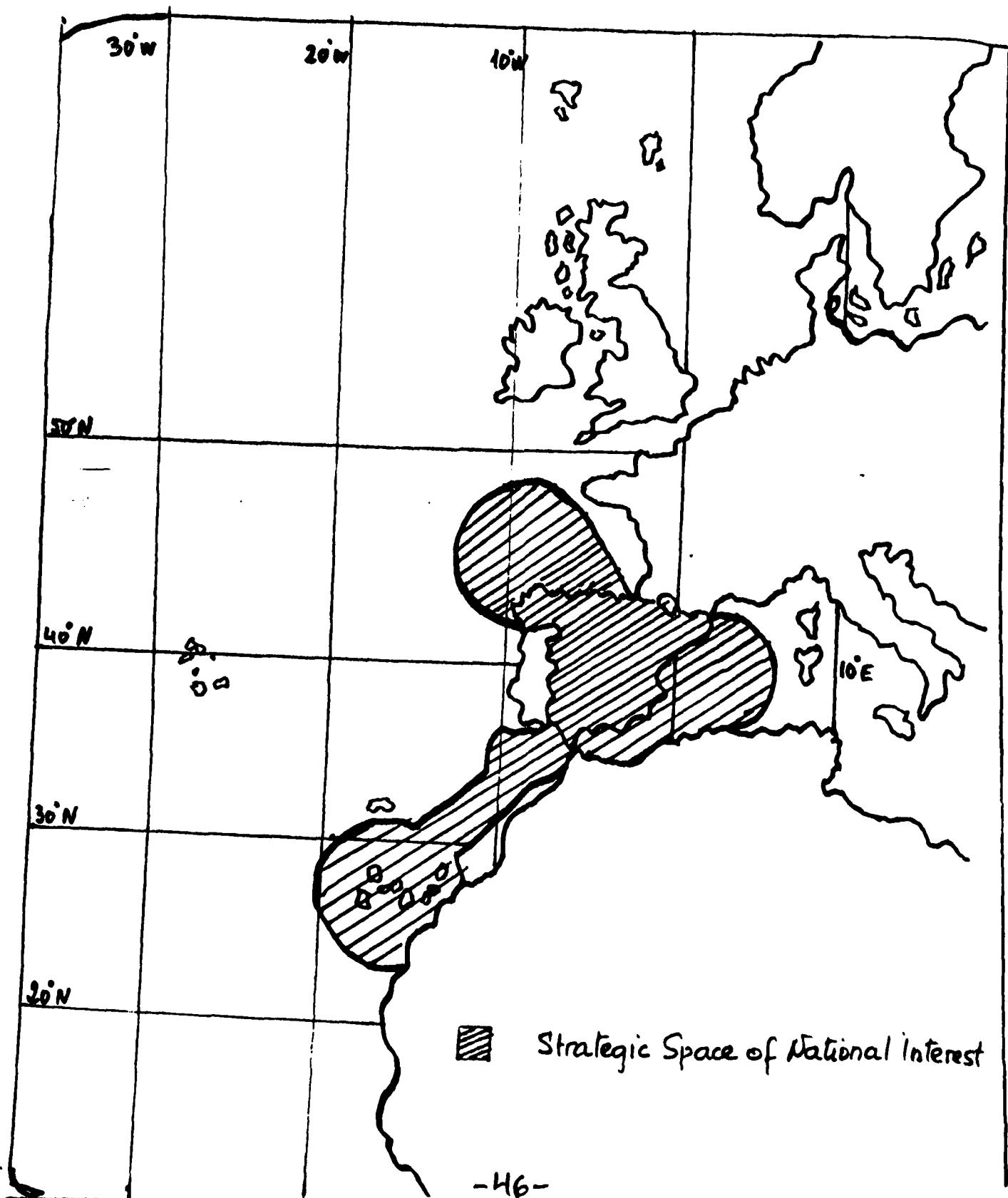


Published by DENoyer-GEPPERT CO., Chicago

卷之三

DIRECT —→ INDIRECT

Appendix I



APPENDIX J

SPANISH MILITARY CONTRIBUTION TO NATO (1)

**TOTAL ARMED FORCES:**

**ACTIVE:** 109,500 (206,000 conscripts) (to be reduced).

*Terms of service: volunteers 16, 18, 24 or 36 months; conscripts 12 months.*

**RESERVES:** 2,400,000 (all services to age 38)

1,030,000 (service in past 5 years): Army:

820,000; Navy: 135,000; Air Force: 35,000.

**ARMY:** 212,000 (164,000 conscripts):

*Plan ME 74*, a modernization and reorganization programme, is in progress incl strength reduction. Data is subject to change.

8 Regional Operational Commands incl 2 Overseas:

1 armd div (1 armd, 1 mech bde).

1 mech div (2 mech bde).

1 mot div (2 mot, 1 mech, bde).

2 mtn div (each 2 bde).

2 armd cav bde

1 air portable bde.

1 inf regt.

1 coast arty comd (6 mixed arty regt; 1 coast arty gp).

6 special ops bn.

5 regional engr bn.

1 Spanish Legion (7,000): 4 regt;

2 with 1 mech, 1 mot bn, 1 ATK coy; 1 with 2 mot bn; 1 (depot) regt with 1 special ops bn, 1 trg bn, 1 lt cavalry gp, 1 spt bn.

General Reserve Force:

1 AB bde (3 bn).

1 AD comd (6 AD regt incl 1 HAWK SAM gp, 1 Nike Hercules bty).

1 fd arty comd (1 locating, 1 MRI regt).

1 engr comd (4 engr regt incl 2 railway).

Royal Guard Regt (incl inf, naval, air force coy and escort cav sqn)

Aviation (FAMET): 40 armed hel.

HQ with 1 hel, 1 spt, 1 trg sqn.

1 attack bn.

1 tpt bn (1 med, 1 hy coy).

1 utility units.

**EQUIPMENT:**

**MBT:** 838; 299 AMX-30 (150 to be mod), 329 M-47E1, 46 M-47E2, 164 M-48ASE.

**LIGHT TANKS:** 127 M-41 (in store).

**RECCE:** 340 VEC.

**MICV:** 584 BMR-600.

**APC:** 1,196 M-113.

**TOWED ARTY:** 913: 105mm: 425 M-26, 170 M-56 pack; 122mm: 176 122/46; 155mm: 84 M-114, 6 M-44; 203mm: 28 8-in, 24 M-115.

**SP ARTY:** 160: 105mm: 48 M-108; 155mm: 96 M-109A; 175mm: 12 M-107; 203mm: 4 M-55.

**COAST ARTY:** 6-in: 113; 203mm: 24; 305mm: 14; 381mm: 7.

**MRL:** 140mm: 14 *Teruel*; 216mm: 16 *L-21*.

**MORTARS:** 107mm: 300 M-2; 120mm: 442 M-40.

**ATGW:** 443 *Milan*, 28 *HOT*.

**RCL:** 106mm: 850.

**AD GUNS:** 20mm: 469 GAI-BOI; 35mm: 92 GDI-002 twin; 40mm: 274 L-70.

**SAM:** 9 *Nike Hercules*, 24 *Improved HAWK*, some *Rapier* some *SA-2 Guideline*/Upade.

**HELICOPTERS:** 69 HH-38/10B (CH-46D), 70 HH-15 118 with 20mm guns, 28 with *HOT* A, 1 AB-206A, 8 AB-212, 12 HR-12B, 30 AS-332, 18 UH-1Z.

**DEPLOYMENT:**

**CEUTA AND MELILLA:** 15,800;

2 armd cav, 2 Spanish Legion, 2 mixed arty regt; 2 HAD bn, 2 engr, 1 coast arty gp.

**BALEARIC ISLANDS:** 5,600:

1 inf regt; 2 inf bn, 1 arty regt; 2 fd arty, 1 coast arty, 1 engr bn, 1 special ops coy.

**CANARY ISLANDS:** 10,000;

2 inf bn, 1 Spanish Legion, 2 coast arty regt, 2 engr bn, 2 special ops'coy.

(MILITARY BALANCE)

## SPANISH MILITARY CONTRIBUTION TO NATO (2)

**NAVY:** 45,000, incl marines (27,000 conscripts).

5 Commands (Fleet, plus 4 Naval Regions):

  Cantabria (Atlantic), Mediterranean, Straits.  
  Canaries.**BASES:** Ferrol (HQ Cantabria), Cadiz/Rota (HQ  
  Straits), Cartagena (HQ Mediterranean), Palma de  
  Mallorca, Mahón, Las Palmas (HQ Canaries).**SUBMARINES:** 8:  4 *Galerna* (Fr *Agosta*) with F-17 and L.5 HWT  
  4 *Delfín* (Fr *Daphné*) with F-17 and L.5 HWT.**PRINCIPAL SURFACE COMBATANTS:** 23:**CARRIERS:** 2 (CVV):  1 *Príncipe de Asturias* (15,000 tonnes; trials and  
    work-up) Air gp about 20 ac: typically 8  
    AV-8B, 8 *Sea King* (Mk 46 LWT), 4 AB-212.  
  1 *Dédalo* (16,000 tonnes; to pay off in 1989 when  
    *Asturias* operational). Air gp about 18 ac:  
    typically 8 AV-8A, 10 hel.**DESTROYERS:** 7:  5 *Churruca* (US *Gearing*) with 1 x 8 .45ROC, 2 x  
    3 ASTT, 2 x 2 127mm guns, 1 Hughes 500 hel;  
  2 *Alcalá Galiano* (US *Fletcher*) with 2 x 3 ASTT, 2  
    x 533mm ASTT, 4 x 127mm guns.**FRIGATES:** 14:  FFG: 8 (AAW/ASW):  
    3 *Santa María* (US FFG-7) with 1 x 1 SM-1  
      MR/Harpoon launcher, 2 x SH-60B hel  
      (from Dec 1988), 2 x 3 ASTT.  
    5 *Baleares* with 1 x 1 SM-1 MR SAM, 1 x 8  
      .45ROC, 2 x 533mm, 4 x 324mm ASTT; plus  
      2 x 4 Harpoon, 1 x 127mm gun.  FF: 6 *Descubierta* with 2 x 3 ASTT, 1 x 2 ASW RL;  
    plus 2 x 2 Harpoon SSM.**PATROL AND COASTAL COMBATANTS:** 63:**PATROL OFFSHORE:** 4 *Atrevida* PCO.**COASTAL:** 12 PCC: 10 *Anaga*, 2 *Nalón* (ex MSC).**INSHORE:** 47: 6 *Lazaga*, 6 *Barceló* PT; 1 *Salvora*  
  PCI, 34 PCI.**MINE WARFARE:** 12:**MCMV:** 12:  4 *Guadalete* (US *Aggressive*) MSO.  8 *Júcar* (US *Adjutant*) MSC.**AMPHIBIOUS:** 5:  2 *Castilla* (US *Paul Revere*) amph tps tpt capacity:  
    1,600 tps.  3 *Velasco* (US *Terrebonne Parish*) LST, capacity:  
    10 MBT and 400 tps.

Plus 11 craft: 3 LC1, 2 LCU, 6 LCM.

**SUPPORT AND MISCELLANEOUS:** 20:  1 *Tvide* AOR, 1 tpt, 5 ocean tugs, 1 Royal Yacht,  
    4 water carriers, 6 AGHS, 2 trg.**NAVAL AIR:****FQA:** 1 sqn with AV-8A *Matador* (*Harrier II*), TAV-8A.**LIAISON:** 1 sqn with 6 *Comanche*, *Citation*.**HELICOPTERS:** 5 sqn:**ASW:** 3 sqn:

1 with Hughes 500.

1 with AB-212 ASW.

  1 with SH-3D/G *Sea King* (mod to SH-3H  
    standard).**AEW:** 1 flt with SH-3D (*Searchwater* radar) due to  
  be operational in 1987.**COMMAND/RECCE:** 1 sqn with AB-212.**TRAINING:** 1 sqn with Bell 47G.**EQUIPMENT:** 13 cbt ac, 33 armed hel.**AIRCRAFT:**

AV-8: 13. -A: 8 (FGA); -B: 3 (FGA); TAV-8A: 2 (trg).

*Comanche*: 2 (liaison). *Twin Comanche*: 2  
    (liaison). *Citation II*: 2 (liaison).**HELICOPTERS:**

AB-212: 12 (ASW/SAR).

*Sea King*: 13 (10 ASW, 3 AEW).

Hughes 500M: 11 (ASW).

Bell 47G: 8 (liaison).

**MARINES:** (8,500)

1 marine regt (3,800), 2 inf, 1 spt bn, 1 arty bty.

5 marine garrison regt.

**EQUIPMENT:****MOT:** 18 M-48E**AFV:** 17 *Scorpion* IFV, 19 FVLP, 7 amph**TOWED ARTY:** 105mm: 12 Oto Melara M-56 pack**SP ARTY:** 105mm: 8 M-52A1, 155mm: 6 M-109A**ATGW:** 12 TOW, 12 *Dragon***RL:** 88mm: M-65, 90mm: C-90C**RCL:** 106mm: 66

## APPENDIX J

### SPANISH MILITARY CONTRIBUTION TO NATO (3)

**AIR FORCE:** 32,500 (to be reduced).

**COMBAT AIR COMMAND (M.A.COM):** 4 wings

**FIGHTER:** 8 sqn:

- 2 with EF-18 (F-18 *Hornet*);
- 2 with F-4C/RF-4C (F-4C to retire 1989);
- 2 with *Mirage* IIIE/EB;
- 2 with *Mirage* F-1CE/BE.

**TACTICAL AIR COMMAND (M.TAC):** 3 wings.

FGA: 2 sqn with F-5A, F-5B, RF-5A.

OCU: 2 sqn with F-5B.

MR: 1 sqn with P-3A.

LIAISON: 1 sqn with Do-27.

AAM: *Sparrow*, *Sidewinder*, R-550 *Magic*.

**AIR COMMAND, CANARY ISLANDS (MACAN):**

FGA: 1 sqn with *Mirage* F-1EE.

TRANSPORT: 1 sqn with C-212 *Aviocar*, Do-27.

SAR: 1 sqn with F-27 ac, AS-332 hel.

**TRANSPORT COMMAND (M.ATR.I):** 3 wings.

TRANSPORT: 6 sqn with C-130, KC-130, C-212,

DHC-4.

**TRAINING COMMAND (MAPER):**

**TRAINING:**

11 ac sqn with Piper (*Aztec*, *Navajo*), Beech (*Bonanza*, *Baron*), C-101 *Aviojet*, C-212, T-34 (to be replaced by E-26 *Támniz*).

2 hel sqn: 1 with AB-205A, UH-1H; 1 with Hughes 300, Bell-47G/OH-13.

**MATERIEL COMMAND (MAMAT):** 1 wing.

TRIALS: 1 sqn with C-101, C-212.

**AIR FORCE HQ GROUP (ACGA):**

TRANSPORT: 1 hel sqn with SA-330, AS-332.

1 ac sqn with Boeing 707 (tkr/tpt), Falcon 900, Falcon 50, Falcon 20, 1 DHC-8 (to be replaced). (VIP)

SAR: 3 sqn (incl 1 under MACAN):

- 1 with C-212 ac, AS-332 hel;
- 1 with C-212 ac, AS-332, SA-319 hel;
- 1 (MACAN) with F-27 ac, AS-332 hel.

SUPPORT: 2 sqn with C-215, Do-27/C-127.

LIAISON: 1 ac sqn with C-212, Do-27/C-127;

1 hel sqn with SA-330, AS-332.

**EQUIPMENT:** 209 cbt ac, no armed hel.

**AIRCRAFT:**

- EF-18 A/B: 46 (FGA, OCU).
- F-5: 51: -A: 14 (FGA); -B: 25 (3 FGA, 22 OCU);
- RF-5A: 12 (recce).
- Mirage*: 86: F-1CE: 36 (ftr); F-1BE: 5 (ftr); F-1EE: 21 (ftr); IIIE: 18 (ftr); IINED: 6 (ftr); F-4C: 32 (ftr); RF-4C: 4 (recce).
- P-3A: 6 (MR).
- Boeing 707: 2 (tkr/tpt).
- C-130H: 12: 7 (tpt); KC-130H: 5 (tkr).
- C-212: 82 (38 tpt, 11 SAR, 5 liaison, 12 trg; -E: 14 tpt; TR-12D: 2 FW).
- C-101: 85 (trg).
- CL-215: 13 (sp).
- DHC-4: 21 (tpt).
- Falcon 20: 4 (VIP tpt).
- Falcon 50: 1 (VIP tpt).
- Falcon 900: 1 (VIP tpt).
- F-27: 3 (SAR).
- Do-27/CASA C-127: 58 (liaison).
- T-34: 21 (trg).
- Other: 68 (*Aztec* 6, *Navajo* 2, *Bonanza* 43, *Baron* 17).

**HELICOPTERS:**

- AB-205: 13 (trg). AB-206: 4 (trg). *Alouette* III: 6 (SAR). *Puma*: 6 (tpt). *Super Puma*: 11 (9 SAR, 2 tpt). Hughes 269A (TH-55A): 17 (trg). Bell 47/OH-13: 25 (trg).

## EFA - THE EUROPEAN FIGHTER AIRCRAFT

The European Fighter Aircraft programme started with high hopes in spite of the loss of the French partner. It is now in full swing and well on time, hoping to beat its possible competitors in the race to equip European air forces in the 1990s. Much has been achieved, particularly in creating industrial consortia which cross national boundaries, and many initial difficulties have been overcome. However, it is now running into trouble as defence budgets are coming under pressure while development costs are mounting. A great effort is required by governments and industries alike to ensure that this crucial project does not fail.

DAVID SAW

Few projects are as important to the future of the European aerospace industries as the Eurofighter (EFA) and its competitor from France the Rafale. These two aircraft represent the next generation of European combat aircraft and will also be the European entry into the export market from the end of the century. The genesis of EFA could be described as troublesome, as with collaborative projects much time is spent in argument before anything concrete is done. In terms of EFA, the arguments continued for quite a time and to a certain extent they are still in progress. Originally the EFA programme was to include five countries, but whilst the three countries which participated in the Tornado programme (Germany, Italy and Britain) and, additionally Spain were able to agree on the aircraft they wanted, France was not.

### THE RECORD

The loss of French participation in the programme during 1985 was a blow to the project. The inclusion of Dassault, arguably the most successful European aircraft exporter, would have been of great benefit

to the programme. Their participation as well as that of the rest of French industry would have opened up the French Air Force to the aircraft. It would have also been very useful in the export markets, where 1,362 Mirage aircraft are in service which would eventually have to be replaced. The fact that Dassault could be expected to win a good percentage of the orders for the replacement of these aircraft would, with French participation in EFA, have provided a good cushion of overseas work for the programme.

Despite France's absence, the four nations involved have achieved much in recent years. Germany, Italy and Britain have proved through the Panavia consortium that European nations can collaborate and produce aircraft of the highest standards. In total 933 Tornado aircraft have been ordered, with 853 going to the three nations and 80 aircraft for export outside Europe. The success of Tornado has helped the case for EFA, as if three air arms can agree on a requirement for a combat aircraft why not four?

This agreement did prove possible and on 15 August 1985, the Ministers of De-

fence of the four nations signed an agreement in Turin to embark on the initial phase of the EFA programme. By the end of that year the Air Staffs of the four nations had agreed to specify a European Specification (ESR) for the aircraft which sees it being optimised for the air combat role but also having a significant air ground capability.

The aircraft will have a basic mass empty of 9,75 tonnes, be a twin engine design producing 90kN of thrust, have a wing area of 50 square metres and the wing platform a moderate aspect ratio delta with a 15 metre span and a straight leading edge swept back at an angle of 53 degrees. The design is aerodynamically unstable with pitch control being provided by a foreplane, otherwise known as a canard, and elevators using fly-by-wire active controls to provide longitudinal stability.

The fact that EFA is being developed now will enable the design to take advantage of the significant aeronautical technology advances of the past few years. Fly-by-wire is one of these, but many other innovative features are included in the design. One of them is the extensive use of carbon fibre composites and the new super light-weight metal alloys such as Lital.

## THE EUROPEAN FIGHTER AIRCRAFT

(2)

Lital aluminium structural alloys will be the main metallic alloys structural material for EFA and it will be the world's first production aircraft to use them. Alcan have worked with the Royal Aircraft Establishment at Farnborough to develop the Lital family of alloys of which three types are available (Lital A, B and C). It will be considered as a substitute for Lital A on a part by part basis for production models of the EFA. It will play its part in providing a structure for the aircraft that will be lighter, more reliable and cost effective than previous designs. The use of such techniques as super plastic forming and diffusion bonding will contribute to a dramatic weight saving (as much as 20% in some areas).

## THE ENGINE

The engine for EFA will, like the aircraft itself, be a collaborative effort involving the four countries. The Tornado programme proved that collaborative engine programmes could work and the three companies responsible for the RB199 - Rolls-Royce, Fiat Aviazione and MTU which formed the Turbo-Union consortium - will be involved in the EFA engine programme.

As befits a modern design, the EJ200 will include a number of advanced high technology features; including single crystal turbine blades, three dimensional transonic compressors and turbine design, full authority digital engine controls, power metallurgy discs, brush seals and an integrated health monitoring system. The EJ200 will also have convergent/divergent nozzles to give increased performance at high Mach numbers. All of the four companies involved with the engine are putting great emphasis on supportability, to provide the engine with high reliability and high maintainability.

A work-sharing arrangement for the engine has been agreed. Rolls-Royce will provide the combustion system, the high pressure turbine and the intermediate casing, MTU the low and high pressure compressors and Fiat the low pressure turbine and interstage support, the reheat system, the gearbox and oil system, whilst Sener will produce for the convergent/divergent nozzles, the jet pipe, exhaust diffuser, and the low pressure shaft and bypass duct. In percentage terms the Eurojet workshare is: Rolls-Royce 33%, MTU 33%, Fiat Aviazione 21% and SENER 13%. The consortium believes that 2,000 EJ200 engines will be required over the life of the EFA programme.

One area that remains to be settled is the choice of engine for the prototypes of the aircraft. The EF200 will be the powerplant for all of the production EFAs, but it will not be available for use during the prototype phase of the EFA development programme. The four development EFA airframes will require a total of 11 engines.

The fact that an American engine might be selected for the prototype has brought into focus a number of issues regarding the EFA programme. If US equipment is included, the US government will, due to its technology transfer rules, have a say in the export of such aircraft. Should the country interested in EFA be regarded with suspicion by the United States, they can block the sale. There are precedents for this action, due to their US-supplied engines both the Saab Viggen and the IAI Kfir lost a number of export opportunities. As export sales will be important for the long-term success of the EFA programme, the presence of US equipment is therefore an area of concern.

## THE RADAR

A crucial component of EFA is at present causing the greatest controversy over the Europe versus US approach in selecting EFA equipment: the radar. Two contenders are bidding for the contract, one with a European design and the other with a derivation of a US design. The four partner countries have each nominated a prime contractor for the radar, Ferranti in the UK, FIAR in Italy, INISEL in Spain and AEG in Germany.

The AN/APG-65 solution for the EFA radar requirement is led by AEG in Germany, with GEC Avionics in Britain, FIAR in Italy and INISEL in Spain. While, in its present form, it does not meet the EFA requirement, the companies believe that it offers the basis for the development of a radar for EFA. Called the MSD (Multi-mode/Silent/Digital) it uses the core of the AN/APG-65 and adds a new transmitter/receiver, re-configurable signal processor, data processor and a continuous wave illuminator. The originator of the radar, Hughes, would be involved in the MSD as a sub-contractor to the MSD prime contractor AEG.

The more authentically European entry for the EFA radar requirement is being proposed by Ferranti, FIAR and INISEL. This is the ECR-90, which is an X-band radar with wide-band spread spectrum transmission and a very powerful processing capability. The power-aperture product is the maximum that the aircraft can afford, which provides the basis for maximum detection performance. The radar offers true multi-mode performance; no mode is adversely affected by optimisation for another mode which allows full

## THE EUROPEAN FIGHTER AIRCRAFT

resolution; this means that superior tactical functions are available. The ECR-90 radar has been designed to offer excellent covert operation with sophisticated counter-measures to ensure survival in a high-threat environment.

The actual mechanics of the EFA radar competition seem almost as complex as designing the radar itself. There are two teams, one led by AEG and the other led by Ferranti; FIAR and INISEL are involved in both teams as the nominated companies from Italy and Spain. Ferranti, whilst working on their ECR-90 submission for the EFA radar, have to keep AEG informed of their progress, as, should the ECR-90 win, AEG would be involved in its production. It is very difficult to disclose information to a competitor especially as one is compelled to by the structure of the EFA programmes, but this is another example of the strange things that can happen in collaborative programmes.

Even stranger is the bidding process for the radar contract. The two groups submitted their bids in accordance with the Request for Proposals for the Full Compliance system in March of this year. However, there are doubts in certain circles over the ability of both radars to be ready in 1995 and this led to the formulation of a second Request for Proposals for a Basic Compliance system. This system was designed to be a lower cost option that would be available in the near term.

To meet this second RfP, the consortia leaders submitted bids on their own but with the knowledge of their partners. Ferranti is offering the Super Vixen radar, which is an improved version of their Blue Vixen radar. AEG is offering a modified AN/APG-65 with a larger antenna and other new features, though the radar software is the same as that in the basic AN/APG-65.

No matter what consortium is selected or which of the four competing radars the EFA radar will have to possess the following features: It must be optimised for air combat, have a high detection range, look-up and look-down modes, multiple target engagement capability, advanced ECCM characteristics, be beyond visual range missile compatible, have integral IFF equipment, be highly reliable, easy to maintain and have low operational costs.

The choice of the radar is perhaps one of the most important elements within the whole EFA programme. The decision will commit the four European nations to this radar for the next 35 years. This is a stern test for any radar system and the selected system must therefore be capable of being developed throughout this time period.

The two consortia competing for the contract illustrate the desire to get the best high technology equipment at the best price for EFA. It is felt that competition with a fixed price contract will lead to deliveries on price and on time, whereas the opposite is usually the case in collaborative programmes. The four main contractors, British Aerospace, MBB, Aeritalia and CASA, are each responsible for integrating certain equipment areas into the EFA programme. As these companies are keen to ensure deliveries on time and on cost, the sub-contractors are being seriously challenged. This is very good for the programme. For most equipment areas from flight controls to the defensive aids suite there are competing consortia. Whilst this should provide good results, one should remember those companies which fail to win EFA contracts. They could be out of a particular business area and in consequence, the EFA programme might act as a catalyst for structural change within the European aerospace industry.

## THE ARMAMENT

The armament for EFA is another interesting and very important area within the programme. It has been decided that the design will include an internal gun mounting, but as yet no specific type has been selected. It is believed that the 27mm Mauser cannon which is used on the Tornado will be selected, due to its advanced design and good performance and that it would also ensure commonality with the Tornado fleet. The EFA will also carry a heavy load (no precise details have been released) of two types of missile, the AIM-120 AMRAAM and the AIM-132 ASRAAM, air-to-air missiles.

The AIM-120 AMRAAM is planned to be the next generation beyond-visual range missile. The AIM-132 ASRAAM and other

selected by the US Air Force and the US Navy. A new company, EURAAM Limited, has been formed by British Aerospace, Marconi Defence Systems, AEG and MBB to compete for the European manufacture and in-service support of the Hughes missile. The other missile, the AIM-132 ASRAAM is currently under development by the European BBG consortium of British Aerospace and Bodenseewerk Geräte-technik. The missile is designed to replace the AIM-9 Sidewinder as the standard NATO short range air-to-air missile. Project definition for ASRAAM is due for completion at the end of this year with an in-service date in the early 1990s.

## FUTURE IN DOUBT

In its current postulated form, EFA should be one of the most effective European combat aircraft ever introduced into service. Despite this, the EFA programme comes about at a time when all of the four nations involved find their military budgets under pressure. This does not affect the procurement of the aircraft yet, but the four governments will soon have to commit themselves to funding the full development and initial production. Sadly, the budgetary pressure in Europe is leading to doubts over the future of EFA altogether.

This is an unfortunate development, as the programme is crucial for the survival of the European aerospace industry in the 1990s and beyond. A number of alternatives have been suggested, the most popular at present being a developed version of the F-18 Hornet. Certainly a developed version of the Hornet would be cheaper to produce and field than the EFA, but this misses the point. Without EFA, the European industries will be forced to leave the advanced combat aircraft market for a generation. This will also harm the avionics, engine and the myriad other concerns that are involved in aircraft production.

The 810 EFA required represent the future of the European aerospace industry. There can be no doubt that this is an expensive programme, but the calamitous consequences in military, political and industrial terms of a cancellation far outweigh its costs.

LIST OF REFERENCES

- 1 J. Salgado Alba. Rear Admiral. "EL ESTRECHO DE GIBRALTAR, CORAZON DE LA ESTRATEGIA MILITAR ESPANOLA". Revista de Marina (Navy Magazine). December, 1984, pp.627. Madrid
- 2 Thomas A. Brooks. Rear Admiral US Navy. "LA MARINA NORTEAMERICANA, LA COMUNIDAD ATLANTICA Y EL ATLANTICO". Revista de Marina. May, 1986, pp.720. Madrid
- 3 Salvador de Madariaga. "SPANIEN, WESEN UND WANDELUNG DEUSTCHE VERLAGE - ANSTAL gmbH". Stuttgart, 1960

## BIBLIOGRAPHY

- \* Adelphi Papers 204. Spain, Domestic Politics And Security Policy. Spring 1986. IISS- London
- \* Bloomgarden, A.H. Europe's "Defense Dilemma". Defense & Disarmament News 3:3-4 Feb'88
- \* Brooks, Thomas A. Rear Admiral, US Navy. La Marina Norteamericana, La Comunidad Atlantica y El Atlantico. Revista de Marina. May 1986. Madrid
- \* Cutler, John M. NATO Strategy for Europe. European attitude in a changing era. Maxwell AFB, April 1981
- \* Documents on Gibraltar. The Spanish Read Book. Presented to the Spanish Cortes by the Minister of Foreign Affairs. Madrid 1965
- \* Eatman, Robert W. NATO and Spain: Who needs whom?. Maxwell AFB, April 1978
- \* Eleta, Juan S.Lt. Col. Spanish Army. Spain's Role in the defense of allied security in NATO. Carlisle Barracks, Pa. 7 April 1986
- \* Ford, Robert E. The Spain-NATO-United States Triangle: Who Controls the Negotiations. Fletcher Forum 12:321-339 Summer '88
- \* Heilberg, William L. Sixteenth nation: Spain's role in Nato. National Defense University Press. Washington '83
- \* Hudson Institute. Alternatives for European Defense in the Next Decade. Harmon-on-Hudson. N.Y. 1962

- \* Marolles, Alain de. Amenazas y Tensiones en el Mediterraneo. Politica Exterior. Prensa Espanola. Madrid 1987.
- \* Menaul, Stewart. The Geostrategic Importance Of The Iberian Peninsula. The Institute for the Study of Conflict. Number 133/1981
- \* Military Balance. 1988-89
- \* Milton T.R. Gen. USAF. The Increasing Importance of Spain and Portugal. Air Force Magazine. August 1981
- \* -----.Airpower in Iberia. Air Force magazine. June 1986
- \* Moss, Kenneth. The Next Step in U.S.- European Relations. Washington Quarterly 11:103-117. Spring '88
- \* Preston, Paul and Denish Smyth. Spain, The EEC and NATO. Clathan House Papers 22. Royal Institute of International Affairs. 1984.
- \* Saigado Alba, J. El Estrecho de Gibraltar, Corazon de la Estrategia Militar Espanola. Revista de Marina. December 1984. Madrid.
- \* Salkin, Yves. Regard Strategique sur L'Espagne. Defense Nationale. March 1988. Paris.
- \* Serra, Narcis. Spanish Minister of Defense. Espana, La Alianza Atlantica y La Seguridad Occidental. International Institute for Strategic Studies. September 1987. Barcelona.
- \* Smith, Dexter J. NATO Needs a New Look. Defense 19:139.Feb'88
- \* Spain's entry into NATO: conflicting political and strategic perspectives. Edited by Federico G. Gil and Joseph S. Tulchin. London 1988.

- \* Stano, Giuseppe. Una Estrategia Para Canarias. Rivista Militare Italiana. May-June 1982. Roma
- \* Treverton, Gregory T. The Strategic Significance Of The Iberian Peninsula. Military Technology. Number 5/1983
- \* Whitaker, Arthur Preston. Spain and defense of the West, ally and liability. New York, Published for the Council on Foreign Relations by Harper. 1961.